
State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Filing at a Glance

Company:	Massachusetts Mutual Life Insurance Company
Product Name:	Long-Term Care
State:	Pennsylvania
TOI:	LTC03I Individual Long Term Care
Sub-TOI:	LTC03I.001 Qualified
Filing Type:	Rate - Other (Not M.U. or G.I. Product)
Date Submitted:	10/04/2022
SERFF Tr Num:	MILL-133345234
SERFF Status:	Closed-Approved
State Tr Num:	MILL-133345234
State Status:	Approved
Co Tr Num:	MASSMUTUAL (513)
Effective	On Approval
Date Requested:	
Author(s):	John Hebig, Alex Moore, Jack Bridges, Andrew Duxbury, Cassi Noel, Megan Anderson, Rylee Sevigny, Lola Heimlich, Blake Wacholz, Cole Miggler, Howard Deng, Jamie Quinn, Andrew Herder
Reviewer(s):	Michael Hibbert (primary), Jim Lavery
Disposition Date:	12/13/2022
Disposition Status:	Approved
Effective Date:	

State Filing Description:

Proposed 27% premium increase on 739 PA policyholders of MM500-P-2-PA, MM502-P-2-PA, et al.

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

General Information

Project Name: MassMutual LTC Rate Increase Filing

Project Number: 145MML01-10.06

Requested Filing Mode: Review & Approval

Status of Filing in Domicile: Pending

Date Approved in Domicile:

Domicile Status Comments: A rate increase filing on the 513 Series was submitted in Massachusetts on September 26, 2022.

Explanation for Combination/Other:

Submission Type: New Submission

Overall Rate Impact: 27%

Market Type: Individual

Individual Market Type:

Filing Status Changed: 12/13/2022

State Status Changed: 12/13/2022

Deemer Date:

Submitted By: Alex Moore

Created By: Blake Wacholz

Corresponding Filing Tracking Number:

State TOI: LTC03I Individual Long Term Care

Filing Description:

On behalf of Massachusetts Mutual Life Insurance Company (MassMutual), we are submitting this rate filing for your review. These are existing tax-qualified policy forms that provide long-term care coverage. These policy forms were written by MassMutual and issued in Pennsylvania between December 26, 2012 and May 8, 2019. These forms are no longer being marketed in any jurisdiction.

The company is requesting a premium rate increase on these forms, including all associated riders. These forms need a premium rate increase due to emerging and projected experience running more adversely than originally expected.

The company is requesting a 30% rate increase for insureds with an automatic inflation option. Please note that the actual rate increase implemented may be immaterially higher than 30% for a small portion of insureds due to administrative rounding algorithms. No rate increase is being requested for insureds without an automatic inflation option. In Pennsylvania, the average rate increase request is 27%.

There have been no previous rate revisions on these forms. The company is seeking a rate increase at this time to help alleviate the adverse performance on this business. If the requested premium rate schedule increase is implemented and the underlying assumptions with moderately adverse conditions reflected are realized, no further premium rate schedule increases are anticipated.

The company will offer insureds affected by the premium increase the option of reducing their policy benefits to provide flexibility of choice for those insureds who wish to maintain a premium level reasonably close to what they were paying prior to the rate increase. More detail regarding the company's consumer-friendly treatment of reductions to inflation protection is provided in the enclosed actuarial memorandum.

The company will offer a contingent benefit upon lapse to insureds that trigger a substantial rate increase. Additionally, the company will voluntarily offer a contingent benefit upon lapse to insureds affected by the rate increase, even if the increase is not considered substantial.

Company and Contact

Filing Contact Information

John Hebig, Actuary

john.hebig@milliman.com

State: Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI: LTC03I Individual Long Term Care/LTC03I.001 Qualified
Product Name: Long-Term Care
Project Name/Number: MassMutual LTC Rate Increase Filing/145MML01-10.06

8500 Normandale Lake Blvd. 952-820-2488 [Phone]
Suite 1850 952-897-5301 [FAX]
MN
MINNEAPOLIS, MN 55437-3830

Filing Company Information

(This filing was made by a third party - millimaninc)

Massachusetts Mutual Life

CoCode: 65935

State of Domicile:

Insurance Company

Group Code: 435

Massachusetts

1295 State Street

Group Name:

Company Type:

Springfield, MA 01111

FEIN Number: 04-1590850

Life/Accident/Health

(413) 788-8411 ext. [Phone]

State ID Number:

State: Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI: LTC03I Individual Long Term Care/LTC03I.001 Qualified
Product Name: Long-Term Care
Project Name/Number: MassMutual LTC Rate Increase Filing/145MML01-10.06

Filing Fees

State Fees

Fee Required? Yes
Fee Amount: \$150.00
Retaliatory? Yes
Fee Explanation: There is a \$150 filing fee in the state of domicile.
Per Company: Yes

Company	Amount	Date Processed	Transaction #
Massachusetts Mutual Life Insurance Company	\$150.00	10/04/2022 03:15 PM	240838047
EFT Total	\$150.00		

SERFF Tracking #:	MILL-133345234	State Tracking #:	MILL-133345234	Company Tracking #:	MASSMUTUAL (513)
State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company		
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
Product Name:	Long-Term Care				
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06				

Correspondence Summary

Dispositions

Status	Created By	Created On	Date Submitted
Approved	Michael Hibbert	12/13/2022	12/13/2022

Objection Letters and Response Letters

Objection Letters

Status	Created By	Created On	Date Submitted
Disapproved	Michael Hibbert	10/26/2022	10/26/2022

Response Letters

Responded By	Created On	Date Submitted
Howard Deng	12/06/2022	12/06/2022

SERFF Tracking #:	MILL-133345234	State Tracking #:	MILL-133345234	Company Tracking #:	MASSMUTUAL (513)
State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company		
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
Product Name:	Long-Term Care				
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06				

Disposition

Disposition Date: 12/13/2022

Effective Date:

Status: Approved

Comment: Dec 13, 2022

John Hebig, Consulting Actuary
 Milliman, Inc.
 8500 Normandale Lake Blvd., Suite 1850
 Minneapolis, MN 55437

RE: Proposed 27.3% premium increase on 739 PA policyholders of MM500-P-2-PA, MM502-P-2-PA, et al.
 Pennsylvania Insurance Department ID # MILL-133345234

Dear John Hebig:

The Department approves the requested average increase of 27.3% as shown in the seriatim policy listing from Attachment #9 of the file PA_513_Supplement Attachments_20221004.xlsx as submitted on Oct 4, 2022.

Sincerely,

Michael Hibbert
 Actuarial Associate
 Bureau of Life, Accident and Health Insurance

Company Name:	Overall % Indicated Change:	Overall % Rate Impact:	Written Premium Change for this Program:	Number of Policy Holders Affected for this Program:	Written Premium for this Program:	Maximum % Change (where req'd):	Minimum % Change (where req'd):
Massachusetts Mutual Life Insurance Company	27.000%	27.000%	\$603,664	739	\$2,212,212	30.000%	0.000%

Schedule	Schedule Item	Schedule Item Status	Public Access
Rate	Rate Tables		Yes

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Schedule	Schedule Item	Schedule Item Status	Public Access
Supporting Document	Transmittal Letter (A&H)		Yes
Supporting Document	Actuarial Certification (A&H)		Yes
Supporting Document	Actuarial Memorandum and Explanatory Information (A&H)		Yes
Supporting Document	Advertisements (A&H)		Yes
Supporting Document	Authorization to File (A&H)		Yes
Supporting Document	Insert Page Explanation (A&H)		Yes
Supporting Document	Rate Table (A&H)		Yes
Supporting Document	Replacement Form with Highlighted Changes (A&H)		Yes
Supporting Document	Advertisement Compliance Certification		Yes
Supporting Document	Reserve Calculation (A&H)		Yes
Supporting Document	Variability Explanation (A&H)		Yes
Supporting Document	Numerical Data in Excel		Yes
Supporting Document	Rate Tables in Excel		Yes
Supporting Document	Sample Policyowner Notification Letter		Yes
Supporting Document	Response to October 26, 2022 Requests		Yes

State: Pennsylvania
TOI/Sub-TOI: LTC03I Individual Long Term Care/LTC03I.001 Qualified
Product Name: Long-Term Care
Project Name/Number: MassMutual LTC Rate Increase Filing/145MML01-10.06
Filing Company: Massachusetts Mutual Life Insurance Company

Objection Letter

Objection Letter Status Disapproved
Objection Letter Date 10/26/2022
Submitted Date 10/26/2022
Respond By Date

Dear John Hebig,

Introduction:

Oct 26, 2022

John Hebig, Consulting Actuary
Milliman, Inc.
8500 Normandale Lake Blvd., Suite 1850
Minneapolis, MN 55437

RE: Proposed 27.3% premium increase on 739 PA policyholders of MM500-P-2-PA, MM502-P-2-PA, et al.
Pennsylvania Insurance Department ID # MILL-133345234

Dear John Hebig:

The captioned filing has been reviewed by the Pennsylvania Insurance Department. It has been determined that the filing fails to meet the requirements of our Insurance Company Laws or regulations and is therefore disapproved pursuant to the authority granted under Section 304(a) of Act 134, the Accident and Health Filing Reform Act. In the event you have any questions regarding the stated concerns, please feel free to contact the Department for further clarification.

The disapproved filing may be resubmitted within 120 days of the date of disapproval. If the Department does not hear from you within 120 days, the subject filing will be permanently closed. Such filings resubmitted after 120 days must be submitted as a new filing, inclusive of appropriate filing fees and disclosure of the closed filing SERFF tracking number.

Please furnish the following information to the Department.

1. Section 18 of the actuarial memorandum states that "The adverse experience is driven by higher-than-expected persistency and morbidity".

Please discuss further the adverse morbidity and persistency experience that resulted in the need for the current rate increase. In particular, discuss re-pricing assumptions that have changed from the last increase approved nationwide, discuss any changes due to internal experience studies, and discuss any changes due to updated consultant data.

2. Has Covid 19 been factored into your projections.

3. Please provide the letter that will be used to notify policy holders of the pending rate increase.

4. Please provide your best estimate of the date when the first letter will be mailed informing policyholders of this premium increase.

5. Please confirm that no increase on this block has been implemented in any jurisdiction; otherwise, provide the rate increase history by state on this series (include a column that shows the cumulative increase by state) in an Excel spreadsheet.

6. Have you included a margin for adverse experience in your projected claims? Is the margin uniform or does it vary in some way? Please explain.

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

7. The requested increase on this block is 27.3%. Yet, when we calculate the annual ratio of the premium generated from the current requested increase (calculated via subtraction of the earned premium column vectors) divided by the current annual original premium taken from Exhibit 1, the ratio does not converge to the requested increase. Why does the ratio eventually converge to roughly 22.7%, rather than 27.3%?

8. Please describe the downgrade options available to policyholders which would mitigate the premium increase.

Sincerely,

Michael Hibbert
Actuarial Associate
Bureau of Life, Accident and Health Insurance

Conclusion:

Sincerely,
Michael Hibbert

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Response Letter

Response Letter Status	Submitted to State
Response Letter Date	12/06/2022
Submitted Date	12/06/2022

Dear Michael Hibbert,

Introduction:

On behalf of Missy Gordon, thank you for reviewing this filing.

Response 1

Comments:

Please see the attached documents in response to your October 26, 2022 requests.

Changed Items:

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Supporting Document Schedule Item Changes

Satisfied - Item:	Sample Policyowner Notification Letter
Comments:	
Attachment(s):	Notification Letter 20221017 generic.pdf

Supporting Document Schedule Item Changes

Satisfied - Item:	Sample Policyowner Notification Letter
Comments:	
Attachment(s):	Notification Letter 20221017 generic.pdf

Satisfied - Item:	Response to October 26, 2022 Requests
Comments:	
Attachment(s):	PA_Response to 20221026 Objection_MML_20221206.pdf

Conclusion:

Thank you for working with us to complete this filing. Please let us know if you have any additional questions.

Sincerely,

SERFF Tracking #:	MILL-133345234	State Tracking #:	MILL-133345234	Company Tracking #:	MASSMUTUAL (513)
State:	Pennsylvania			Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
Product Name:	Long-Term Care				
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06				

Alex Moore

SERFF Tracking #:	MILL-133345234	State Tracking #:	MILL-133345234	Company Tracking #:	MASSMUTUAL (513)
State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company		
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
Product Name:	Long-Term Care				
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06				

Rate Information

Rate data applies to filing.

Filing Method:	Review and Approval
Rate Change Type:	Increase
Overall Percentage of Last Rate Revision:	%
Effective Date of Last Rate Revision:	
Filing Method of Last Filing:	N/A
SERFF Tracking Number of Last Filing:	

Company Rate Information

Company Name:	Overall % Indicated Change:	Overall % Rate Impact:	Written Premium Change for this Program:	Number of Policy Holders Affected for this Program:	Written Premium for this Program:	Maximum % Change (where req'd):	Minimum % Change (where req'd):
Massachusetts Mutual Life Insurance Company	27.000%	27.000%	\$603,664	739	\$2,212,212	30.000%	0.000%

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Rate/Rule Schedule

Item No.	Schedule Item Status	Document Name	Affected Form Numbers (Separated with commas)	Rate Action	Rate Action Information	Attachments
1		Rate Tables	MM500-P-2-PA, MM502-P-2-PA, et al.	Revised	Previous State Filing Number: Percent Rate Change Request: 27	PA_513_Current Rate Tables_20221004.pdf, PA_513_Proposed Rate Tables_20221004.pdf,

Massachusetts Mutual Life Insurance Company
1295 State Street, Springfield, MA 01111
513 Series
Current Premium Rates

Issue Age	Annual Base Rates per \$10 of Daily Benefit Amount	Premium Factors					
		Inflation Protection			Nonforfeiture Shortened BP	Cov Part Prem Waiv	Paid-Up Survivor
	Comprehensive	None	3% Compound	5% Compound			
18	\$88.00	1.000	2.361	6.480	1.119	1.010	1.065
19	\$88.00	1.000	2.361	6.446	1.119	1.010	1.065
20	\$88.00	1.000	2.361	6.411	1.118	1.010	1.065
21	\$88.00	1.000	2.361	6.377	1.118	1.010	1.065
22	\$88.00	1.000	2.361	6.343	1.117	1.010	1.065
23	\$88.00	1.000	2.361	6.302	1.116	1.010	1.065
24	\$88.00	1.000	2.361	6.261	1.115	1.010	1.065
25	\$88.00	1.000	2.361	6.220	1.115	1.010	1.065
26	\$88.00	1.000	2.361	6.179	1.114	1.010	1.065
27	\$88.00	1.000	2.361	6.138	1.113	1.010	1.065
28	\$88.00	1.000	2.361	6.101	1.112	1.010	1.065
29	\$88.00	1.000	2.361	6.065	1.112	1.010	1.065
30	\$88.00	1.000	2.361	6.028	1.111	1.010	1.065
31	\$88.00	1.000	2.361	5.992	1.111	1.010	1.065
32	\$88.00	1.000	2.361	5.955	1.110	1.010	1.065
33	\$88.00	1.000	2.361	5.923	1.109	1.010	1.065
34	\$88.00	1.000	2.361	5.890	1.108	1.010	1.065
35	\$88.00	1.000	2.361	5.858	1.107	1.010	1.065
36	\$88.00	1.000	2.361	5.825	1.106	1.010	1.065
37	\$88.00	1.000	2.361	5.793	1.105	1.010	1.065
38	\$89.39	1.000	2.351	5.677	1.104	1.010	1.066
39	\$90.78	1.000	2.341	5.561	1.103	1.010	1.067
40	\$92.16	1.000	2.330	5.445	1.103	1.010	1.068
41	\$93.55	1.000	2.320	5.329	1.102	1.010	1.069
42	\$94.94	1.000	2.310	5.213	1.101	1.010	1.070
43	\$97.28	1.000	2.299	5.106	1.101	1.010	1.072
44	\$99.61	1.000	2.288	4.999	1.101	1.010	1.074
45	\$101.95	1.000	2.277	4.892	1.100	1.010	1.076
46	\$104.28	1.000	2.266	4.785	1.100	1.010	1.078
47	\$106.62	1.000	2.255	4.678	1.100	1.010	1.080
48	\$110.09	1.000	2.229	4.549	1.100	1.010	1.084
49	\$113.56	1.000	2.202	4.419	1.100	1.010	1.088
50	\$117.04	1.000	2.176	4.290	1.100	1.010	1.092
51	\$120.51	1.000	2.149	4.160	1.100	1.010	1.096
52	\$123.98	1.000	2.123	4.031	1.100	1.010	1.100
53	\$130.26	1.000	2.079	3.889	1.100	1.010	1.104
54	\$136.54	1.000	2.036	3.748	1.100	1.010	1.108
55	\$142.82	1.000	1.992	3.606	1.100	1.010	1.112
56	\$149.10	1.000	1.949	3.465	1.100	1.010	1.116
57	\$155.38	1.000	1.905	3.323	1.100	1.010	1.120
58	\$166.08	1.000	1.858	3.191	1.100	1.010	1.124
59	\$176.78	1.000	1.810	3.058	1.100	1.010	1.128
60	\$187.47	1.000	1.763	2.926	1.100	1.010	1.132
61	\$198.17	1.000	1.715	2.793	1.100	1.010	1.136
62	\$208.87	1.000	1.668	2.661	1.100	1.010	1.140
63	\$228.81	1.000	1.639	2.585	1.100	1.012	1.142
64	\$248.76	1.000	1.609	2.509	1.100	1.014	1.144
65	\$268.70	1.000	1.580	2.432	1.100	1.016	1.146
66	\$288.65	1.000	1.550	2.356	1.100	1.018	1.148
67	\$308.59	1.000	1.521	2.280	1.100	1.020	1.150
68	\$350.04	1.000	1.493	2.207	1.100	1.022	1.150
69	\$391.49	1.000	1.465	2.134	1.100	1.024	1.150
70	\$432.93	1.000	1.437	2.060	1.100	1.026	1.150
71	\$474.38	1.000	1.409	1.987	1.100	1.028	1.150
72	\$515.83	1.000	1.381	1.914	1.100	1.030	1.150
73	\$586.00	1.000	1.367	1.882	1.100	1.036	1.150
74	\$656.16	1.000	1.352	1.850	1.100	1.042	1.150
75	\$726.33	1.000	1.338	1.818	1.100	1.048	1.150
76	\$796.49	1.000	1.323	1.786	1.100	1.054	1.150
77	\$866.66	1.000	1.309	1.754	1.100	1.060	1.150
78	\$978.32	1.000	1.301	1.739	1.100	1.066	1.150
79	\$1,089.98	1.000	1.293	1.724	1.100	1.072	1.150
80	\$1,201.65	1.000	1.286	1.710	1.100	1.078	1.150
81	\$1,313.31	1.000	1.278	1.695	1.100	1.084	1.150
82	\$1,424.97	1.000	1.270	1.680	1.100	1.090	1.150
83	\$1,552.44	1.000	1.252	1.642	1.100	1.092	1.150
84	\$1,679.92	1.000	1.234	1.603	1.100	1.095	1.150

Discounts	Factor
Single	1.000
Partner	0.850
Covered Partner	0.700
Multi-Product	0.950
Multi-Life	0.900

Individual Underwriting Classes	Factor
Ultra Preferred	0.900
Select Preferred	1.000
Preferred	1.250
Standard Plus	2.500
Standard	5.000

Benefit Type	Factor
Daily Reimbursement	1.000
Monthly Home and Community Based Services (HCBS) Rider	1.045

Elimination Period Riders			
Elimination Period	Factor	Enhanced EP	HCBS EP Waiver
30 Day	1.200	1.030	1.070
60 Day	1.100	1.045	1.110
90 Day	1.000	1.060	1.160
180 Day	0.900	1.075	1.250

Rider			
Benefit Period	Premium Factor	Restoration of Benefits	Shared Care
1 Year	N/A	N/A	N/A
1.5 Year	N/A	N/A	N/A
2 Year	0.447	1.040	1.353
3 Year	0.547	1.040	1.290
4 Year	0.613	1.040	N/A
5 Year	0.673	1.040	N/A
6 Year	0.714	1.040	N/A

Payment Mode	Factor
Annual	1.000
Semi-Annual	0.520
Quarterly	0.265
Monthly - Pre-Authorized Check	0.088

Massachusetts Mutual Life Insurance Company
1295 State Street, Springfield, MA 01111
513 Series
Proposed Premium Rates

Issue Age	Annual Base Rates per \$10 of Daily Benefit Amount	Premium Factors					
		Inflation Protection			Nonforfeiture Shortened BP	Cov Part Prem Waiv	Paid-Up Survivor
	Comprehensive	None	3% Compound	5% Compound			
18	\$88.00	1.000	3.069	8.424	1.119	1.010	1.065
19	\$88.00	1.000	3.069	8.380	1.119	1.010	1.065
20	\$88.00	1.000	3.069	8.334	1.118	1.010	1.065
21	\$88.00	1.000	3.069	8.290	1.118	1.010	1.065
22	\$88.00	1.000	3.069	8.246	1.117	1.010	1.065
23	\$88.00	1.000	3.069	8.193	1.116	1.010	1.065
24	\$88.00	1.000	3.069	8.139	1.115	1.010	1.065
25	\$88.00	1.000	3.069	8.086	1.115	1.010	1.065
26	\$88.00	1.000	3.069	8.033	1.114	1.010	1.065
27	\$88.00	1.000	3.069	7.979	1.113	1.010	1.065
28	\$88.00	1.000	3.069	7.931	1.112	1.010	1.065
29	\$88.00	1.000	3.069	7.885	1.112	1.010	1.065
30	\$88.00	1.000	3.069	7.836	1.111	1.010	1.065
31	\$88.00	1.000	3.069	7.790	1.111	1.010	1.065
32	\$88.00	1.000	3.069	7.742	1.110	1.010	1.065
33	\$88.00	1.000	3.069	7.700	1.109	1.010	1.065
34	\$88.00	1.000	3.069	7.657	1.108	1.010	1.065
35	\$88.00	1.000	3.069	7.615	1.107	1.010	1.065
36	\$88.00	1.000	3.069	7.573	1.106	1.010	1.065
37	\$88.00	1.000	3.069	7.531	1.105	1.010	1.065
38	\$89.39	1.000	3.056	7.380	1.104	1.010	1.066
39	\$90.78	1.000	3.043	7.229	1.103	1.010	1.067
40	\$92.16	1.000	3.029	7.079	1.103	1.010	1.068
41	\$93.55	1.000	3.016	6.928	1.102	1.010	1.069
42	\$94.94	1.000	3.003	6.777	1.101	1.010	1.070
43	\$97.28	1.000	2.989	6.638	1.101	1.010	1.072
44	\$99.61	1.000	2.974	6.499	1.101	1.010	1.074
45	\$101.95	1.000	2.960	6.360	1.100	1.010	1.076
46	\$104.28	1.000	2.946	6.221	1.100	1.010	1.078
47	\$106.62	1.000	2.932	6.081	1.100	1.010	1.080
48	\$110.09	1.000	2.898	5.914	1.100	1.010	1.084
49	\$113.56	1.000	2.863	5.745	1.100	1.010	1.088
50	\$117.04	1.000	2.829	5.577	1.100	1.010	1.092
51	\$120.51	1.000	2.794	5.408	1.100	1.010	1.096
52	\$123.98	1.000	2.760	5.240	1.100	1.010	1.100
53	\$130.26	1.000	2.703	5.056	1.100	1.010	1.104
54	\$136.54	1.000	2.647	4.872	1.100	1.010	1.108
55	\$142.82	1.000	2.590	4.688	1.100	1.010	1.112
56	\$149.10	1.000	2.534	4.505	1.100	1.010	1.116
57	\$155.38	1.000	2.477	4.320	1.100	1.010	1.120
58	\$166.08	1.000	2.415	4.148	1.100	1.010	1.124
59	\$176.78	1.000	2.353	3.975	1.100	1.010	1.128
60	\$187.47	1.000	2.292	3.804	1.100	1.010	1.132
61	\$198.17	1.000	2.230	3.631	1.100	1.010	1.136
62	\$208.87	1.000	2.168	3.459	1.100	1.010	1.140
63	\$228.81	1.000	2.131	3.361	1.100	1.012	1.142
64	\$248.76	1.000	2.092	3.262	1.100	1.014	1.144
65	\$268.70	1.000	2.054	3.162	1.100	1.016	1.146
66	\$288.65	1.000	2.015	3.063	1.100	1.018	1.148
67	\$308.59	1.000	1.977	2.964	1.100	1.020	1.150
68	\$350.04	1.000	1.941	2.869	1.100	1.022	1.150
69	\$391.49	1.000	1.905	2.774	1.100	1.024	1.150
70	\$432.93	1.000	1.868	2.678	1.100	1.026	1.150
71	\$474.38	1.000	1.832	2.583	1.100	1.028	1.150
72	\$515.83	1.000	1.795	2.488	1.100	1.030	1.150
73	\$586.00	1.000	1.777	2.447	1.100	1.036	1.150
74	\$656.16	1.000	1.758	2.405	1.100	1.042	1.150
75	\$726.33	1.000	1.739	2.363	1.100	1.048	1.150
76	\$796.49	1.000	1.720	2.322	1.100	1.054	1.150
77	\$866.66	1.000	1.702	2.280	1.100	1.060	1.150
78	\$978.32	1.000	1.691	2.261	1.100	1.066	1.150
79	\$1,089.98	1.000	1.681	2.241	1.100	1.072	1.150
80	\$1,201.65	1.000	1.672	2.223	1.100	1.078	1.150
81	\$1,313.31	1.000	1.661	2.204	1.100	1.084	1.150
82	\$1,424.97	1.000	1.651	2.184	1.100	1.090	1.150
83	\$1,552.44	1.000	1.628	2.135	1.100	1.092	1.150
84	\$1,679.92	1.000	1.604	2.084	1.100	1.095	1.150

Discounts	Factor
Single	1.000
Partner	0.850
Covered Partner	0.700
Multi-Product	0.950
Multi-Life	0.900

Individual Underwriting Classes	Factor
Ultra Preferred	0.900
Select Preferred	1.000
Preferred	1.250
Standard Plus	2.500
Standard	5.000

Benefit Type	Factor
Daily Reimbursement	1.000
Monthly Home and Community Based Services (HCBS) Rider	1.045

Elimination Period Riders			
Elimination Period	Factor	Enhanced EP	HCBS EP Waiver
30 Day	1.200	1.030	1.070
60 Day	1.100	1.045	1.110
90 Day	1.000	1.060	1.160
180 Day	0.900	1.075	1.250

Rider			
Benefit Period	Premium Factor	Restoration of Benefits	Shared Care
1 Year	N/A	N/A	N/A
1.5 Year	N/A	N/A	N/A
2 Year	0.447	1.040	1.353
3 Year	0.547	1.040	1.290
4 Year	0.613	1.040	N/A
5 Year	0.673	1.040	N/A
6 Year	0.714	1.040	N/A

Payment Mode	Factor
Annual	1.000
Semi-Annual	0.520
Quarterly	0.265
Monthly - Pre-Authorized Check	0.088

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Supporting Document Schedules

Satisfied - Item:	Transmittal Letter (A&H)
Comments:	
Attachment(s):	PA_513_Cover Letter_MML_20221004.pdf
Item Status:	
Status Date:	

Bypassed - Item:	Actuarial Certification (A&H)
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	
Status Date:	

Satisfied - Item:	Actuarial Memorandum and Explanatory Information (A&H)
Comments:	
Attachment(s):	PA_513_Act Memo_MML_20221004.pdf PA_513_Supplement_MML_20221004.pdf
Item Status:	
Status Date:	

Bypassed - Item:	Advertisements (A&H)
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	
Status Date:	

Satisfied - Item:	Authorization to File (A&H)
Comments:	
Attachment(s):	Authorization to File 20220926.pdf
Item Status:	
Status Date:	

Bypassed - Item:	Insert Page Explanation (A&H)
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Status Date:	
Bypassed - Item:	Rate Table (A&H)
Bypass Reason:	Rate tables are attached on the Rate/Rule Schedule Tab.
Attachment(s):	
Item Status:	
Status Date:	
Bypassed - Item:	Replacement Form with Highlighted Changes (A&H)
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	
Status Date:	
Bypassed - Item:	Advertisement Compliance Certification
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	
Status Date:	
Bypassed - Item:	Reserve Calculation (A&H)
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	
Status Date:	
Bypassed - Item:	Variability Explanation (A&H)
Bypass Reason:	Not applicable as this is not a form filing.
Attachment(s):	
Item Status:	
Status Date:	
Satisfied - Item:	Numerical Data in Excel
Comments:	
Attachment(s):	PA_513_Supplement Attachments_20221004.xlsx
Item Status:	
Status Date:	

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06		

Satisfied - Item:	Rate Tables in Excel
Comments:	
Attachment(s):	PA_513_Rate Tables_20221004.xlsx
Item Status:	
Status Date:	

Satisfied - Item:	Sample Policyowner Notification Letter
Comments:	
Attachment(s):	Notification Letter 20221017 generic.pdf
Item Status:	
Status Date:	

Satisfied - Item:	Response to October 26, 2022 Requests
Comments:	
Attachment(s):	PA_Response to 20221026 Objection_MML_20221206.pdf
Item Status:	
Status Date:	

SERFF Tracking #:	MILL-133345234	State Tracking #:	MILL-133345234	Company Tracking #:	MASSMUTUAL (513)
<hr/>					
State:	Pennsylvania			Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
Product Name:	Long-Term Care				
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.06				

Attachment PA_513_Supplement Attachments_20221004.xlsx is not a PDF document and cannot be reproduced here.

Attachment PA_513_Rate Tables_20221004.xlsx is not a PDF document and cannot be reproduced here.



8500 Normandale Lake Blvd.
Suite 1850
Minneapolis, MN 55437-3830
USA

Tel +1 952 897 5300

milliman.com

October 4, 2022

Honorable Michael Humphreys
Acting Insurance Commissioner
Pennsylvania Insurance Department (Department)

Via SERFF

Re: Massachusetts Mutual Life Insurance Company (MassMutual)
Company NAIC # 65935
SERFF Tracking # MILL-133345234
513 Series
Tax-Qualified Comprehensive Long-Term Care Policy Form MM500-P-2-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form MM502-P-2-PA et al.

Dear Commissioner Humphreys:

On behalf of MassMutual, we are submitting this rate filing for your review. These are existing tax-qualified policy forms that provide long-term care coverage. These policy forms were written by MassMutual and issued in Pennsylvania between December 26, 2012 and May 8, 2019. These forms are no longer being marketed in any jurisdiction.

The company is requesting a premium rate increase on these forms, including all associated riders. These forms need a premium rate increase due to emerging and projected experience running more adversely than originally expected.

The company is requesting a 30% rate increase for insureds with an automatic inflation option. Please note that the actual rate increase implemented may be immaterially higher than 30% for a small portion of insureds due to administrative rounding algorithms. No rate increase is being requested for insureds without an automatic inflation option. In Pennsylvania, the average rate increase request is 27%.

There have been no previous rate revisions on these forms. The company is seeking a rate increase at this time to help alleviate the adverse performance on this business. If the requested premium rate schedule increase is implemented and the underlying assumptions with moderately adverse conditions reflected are realized, no further premium rate schedule increases are anticipated.

The company will offer insureds affected by the premium increase the option of reducing their policy benefits to provide flexibility of choice for those insureds who wish to maintain a premium level reasonably close to what they were paying prior to the rate increase. More detail regarding the company's consumer-friendly treatment of reductions to inflation protection is provided in the enclosed actuarial memorandum.

The company will offer a contingent benefit upon lapse to insureds that trigger a substantial rate increase. Additionally, the company will voluntarily offer a contingent benefit upon lapse to insureds affected by the rate increase, even if the increase is not considered substantial.

Offices in Principal Cities Worldwide

This work product was prepared to provide assistance to MassMutual. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends Recipient be aided by its own actuary or other qualified professional when reviewing the Milliman work product.

A policyowner notification letter will be provided by the company and included in this filing in the coming weeks.

The following items are included with this submission:

- cover letter
- letter from MassMutual authorizing us to submit this filing on their behalf
- actuarial memorandum
- supplement to the actuarial memorandum
- current and proposed premium rate schedules
- current and proposed premium rate schedules in Excel
- Microsoft Excel spreadsheet containing numerical data

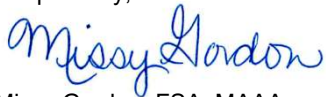
The required \$150 filing fee will be paid via Electronic Funds Transfer (EFT).

The contact person for this filing is:

John Hebig, FSA, MAAA
Consulting Actuary
Milliman, Inc.
8500 Normandale Lake Blvd., Suite 1850
Minneapolis, MN 55437
(952) 820-2488
john.hebig@milliman.com

Thank you for your assistance in reviewing this filing.

Respectfully,

A handwritten signature in blue ink that reads "Missy Gordon".

Missy Gordon, FSA, MAAA
Principal and Consulting Actuary

MAG/bw

Enclosures

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

Address: 1295 State Street, Springfield, MA 01111

513 Series Actuarial Memorandum

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Product

513 Series

Number

Tax-Qualified Comprehensive Long-Term Care Policy Form

MM500-P-2-PA et al.

Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form

MM502-P-2-PA et al.

Massachusetts Mutual Life Insurance Company (MassMutual) is requesting a rate increase on the above-listed long-term care policy forms. The company issued these policy forms in Pennsylvania between December 26, 2012 and May 8, 2019.

Nationwide, the company is requesting the same rate increase, except where required due to regulatory requirements and jurisdiction-specific requirements.

1. Purpose of Filing

This actuarial memorandum has been prepared for the purpose of demonstrating that the requested rate increase meets the minimum requirements of the 2014 National Association of Insurance Commissioners (NAIC) Long-Term Care Insurance Model Regulation (Model Regulation). The enclosed supplement to the actuarial memorandum demonstrates compliance with the applicable regulatory requirements of this jurisdiction to the extent that they differ from the Model Regulation. It may not be suitable for other purposes.

2. Requested Rate Increase

The company is requesting a premium rate increase on the above-listed forms, including all associated riders. These forms need a premium rate increase due to emerging and projected experience running more adversely than previously expected.

The company is requesting a 30% rate increase for insureds with automatic inflation. Please note that the actual rate increase implemented may be immaterially higher than 30% for a small portion of insureds due to administrative rounding algorithms. No rate increase is being requested for insureds without automatic inflation. Nationwide, the average rate increase request is 25%. In Pennsylvania, the average rate increase request is 27%.

Corresponding rate tables reflecting the current and proposed rate levels are enclosed with this filing. An Excel version of the rate tables is also enclosed and represents the rate basis the administrator will use in implementing this rate increase. Actual rates implemented may vary from those in the enclosed rate tables due to implementation rounding algorithms.

As the company is not currently marketing new standalone long-term care products, the required statement that the renewal premium rate schedules are not greater than the new business premium rate schedules is not applicable.

Options for Reducing Benefits

The company offers insureds affected by the premium increase the option of reducing their policy benefits to provide flexibility of choice for those insureds who wish to maintain a premium level reasonably close to what they were paying prior to the rate increase. The company's notification letter outlines several available reduced benefit options (RBO) including:

- reducing the benefit period;
- reducing the maximum daily benefit amount;
- extending the elimination period; and
- removing or reducing optional riders.

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The company administers the reduction or removal of inflation protection in a consumer-friendly manner that exceeds industry norms. Insureds who elect to reduce or drop their inflation protection keep their inflated (current) daily benefit amounts and their premium rates are determined using the reduced inflation option factor and their uninflated (original) daily benefit. This allows for these insureds to significantly mitigate a rate increase, as their premiums are based on their uninflated daily benefit, while maintaining meaningful long-term care coverage, as they will retain all daily benefit inflation accrued to date. Generally, the industry treats these reduced benefit option elections less favorably by determining premium rates using a recalculated uninflated daily benefit that would result in the inflated daily benefit based on the elected inflation protection option.

The table below provides an illustration of the different treatment of removing a 3% compound inflation protection option for an issue age 50 insured with a 5-year benefit period. This illustration is based on common benefit characteristics and MassMutual's nationwide rates for the 513 Series. The premiums before and after RBO election reflecting Industry Treatment are also based on MassMutual's nationwide rates for the 513 Series. In this illustration, MassMutual's consumer-friendly treatment of the inflation RBO results in 23% lower premiums ($= \$788 / \$1,028 - 1 = \$100 / \$130 - 1$) compared to industry norms.

Table 2.1
Illustration of Inflation RBO Treatment Comparison
Issue Age 50 with RBO Election to Remove Inflation Protection in Duration 10

Treatment of Inflation RBO	Daily Benefit Amount (DBA)		Premium Before RBO Election ^[2]	Premium After RBO Election ^[2]
	Uninflated DBA	Inflated DBA ^[1]		
MassMutual Treatment	\$100	\$130	\$2,228	\$788 ^[3]
Industry Treatment	100	130	2,228	1,028 ^[4]

[1] $\$130 = \$100 \times (1+3\%)^{10-1}$

[2] Actual premium rates may vary due to rounding algorithms

[3] Proposed premium based on uninflated DBA (\$100) and no inflation premium rate factor; after RBO retains \$130 DBA

[4] Proposed premium based on inflated DBA (\$130) and no inflation premium rate factor; after RBO retains \$130 DBA

3. Description of Benefits

These are existing tax-qualified policy forms that provide long-term care coverage on a reimbursement basis. They are individually underwritten and provide either comprehensive coverage or facility-only coverage. These forms have benefit eligibility requirements that involve activities of daily living (ADL) deficiencies or cognitive impairment. Waiver of premium is provided when certain benefits are being paid.

A daily benefit amount, benefit period, and elimination period were selected at issue.

At issue, the policyowner may have had the option to choose one of the following inflation options: no inflation, compound 3% inflation, compound 3.5% inflation, or compound 5% inflation. The compound inflation options provide for benefit levels that increase on each anniversary date by 3%, 3.5%, or 5% compounded annually for the life of the insured. These automatic increasing benefits apply even when the insured is in claim status.

The available choices for benefit period, elimination period, and inflation option are shown in Section 21.

Premiums are paid for the life of the policy.

At issue, the policyowner may have been offered the option of selecting riders (e.g., restoration of benefits, shared care) that provide the types of coverage shown in the enclosed rate tables.

These are participating policy forms. Explicit dividend margin was incorporated into the pricing for the business in this filing that was to be released to policyowners if experience emerged as originally expected in pricing. However, as emerging experience is worse than that expected with the dividend

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margin, no dividends have been paid historically nor are expected to be paid going forward on the long-term care business in this filing.

Most jurisdictions included a Partnership-eligible policy form or option, subject to the individual Partnership requirements of each jurisdiction.

The options to reduce benefits, like those described in Section 2, are available any time and not only at the time of a rate increase.

A contingent benefit upon lapse (CBUL) will be available to all policyowners at the time of the rate increase, even if the increase is not considered substantial.

In some jurisdictions, the benefits made available to insureds were limited relative to what was offered nationwide and described above.

4. Renewability

These policies are guaranteed renewable for life.

5. Applicability

This rate increase applies to all policies issued on the policy forms in this jurisdiction. The rate changes will apply to the premium of the base policy form and all associated options and riders.

6. Actuarial Assumptions

The following assumptions are used to project the experience shown in this filing (current assumptions). As described in Appendix A to this memorandum, experience on all of MassMutual's standalone long-term care products available at the time of development was combined in determining the assumptions such that not all product attributes described in Appendix A may apply to this filing as highlighted below.

a. Active Assumptions

- i. Claim Incidence Probabilities were developed using the 2017 Milliman *Long-Term Care Guidelines (Guidelines)* incidence curves with adjustments for retrospective improvement. The incidence curves were developed based on starting site of care—assisted living facility (ALF), home health care (HHC), or skilled nursing facility (SNF)—and further adjusted based on historical experience for sex, partner status, benefit period, inflation option, payment type, underwriting, rate series, and attained age.
- ii. Voluntary Lapse Probabilities vary by policy duration (ultimate for 9+), attained age (ultimate for 70+), inflation option, benefit period, payment method, and partner status at issue (i.e., partnered versus non-partnered). Exhibit A-2a of Appendix A to this memorandum summarizes the ultimate lapse probabilities by key characteristics. The non-lifetime benefit period and lifetime payment option are the only characteristics applicable to the 513 Series as shown in Section 21.
- iii. Active Mortality Probabilities were developed using the 2012 Individual Annuitant Mortality (IAM) Basic table with adjustments to make it applicable to an active life exposure base and reflect retrospective active mortality improvement. These mortality probabilities were then adjusted based on historical mortality experience by sex, partner status, underwriting, policy duration, and attained age. The mortality adjustment factors can be found in Exhibit A-3a of Appendix A to this memorandum.

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b. Disabled Assumptions

- i. Disabled Mortality Probabilities reflect disabled mortality tables developed in conjunction with the *Guidelines*. These mortality probabilities were then adjusted based on historical experience by starting site of care, sex, benefit period, partner status, payment type, claim duration, and incurred age.
- ii. Implied Recovery Probabilities were developed from the composite claim terminations and the disabled mortality assumption with adjustments to ensure the resulting recovery probabilities were reasonable by claim month and across key claimant characteristics. Appendix A to this memorandum provides the formula used to develop the implied recovery probabilities.

c. Utilization Assumption

- i. Policy Duration Utilization was developed using the *Guidelines* with adjustments to reflect recent utilization experience and cost of care trends. The policy duration utilization assumption also captures how utilization by site of care changes over time due to (1) inflation of the daily benefit and (2) cost of care trends.
- ii. Claim Duration Utilization was developed based on the policy duration utilization assumption described above with adjustments for actual claim experience by starting site of care. These adjustments were based on historical utilization experience by benefit period, inflation option, and incurred age. The claim duration adjustment factors can be found in Exhibit A-8a of Appendix A to this memorandum. The non-lifetime benefit period is the only characteristic applicable to the 513 Series as shown in Section 21.

d. Insured Behavior Due to the Rate Increase

At the time of a rate increase, insureds have the option to elect a CBUL or RBO. An increase in morbidity for adverse selection due to the rate increase is assumed based on the percentage of insureds that elect a CBUL and RBO.

Insureds who elect a CBUL are modeled as a lapse (i.e., the CBUL benefit is not modeled), which results in a slightly lower lifetime loss ratio than if the CBUL benefit had been modeled.

CBUL and RBO election rates are determined as a function of the rate increase magnitude. In the year of rate increase implementation, 1.2% of in-force insureds with automatic inflation are assumed to elect a CBUL benefit. An additional 7.2% of in-force insureds with automatic inflation are assumed to reduce benefits to offset the requested rate increase, resulting in a 1.7% reduction in premium and claims. Adverse selection associated with the requested increase is a function of CBUL and RBO election. A cumulative 1.2% increase in morbidity is assumed due to adverse selection from the requested rate increase for insureds with automatic inflation. The assumption is applied on a seriatim basis and based on the requested rate increase described in Section 2.

- e. Prospective Improvement is not assumed for any assumption.
- f. Interest Rate consistent with the maximum valuation interest rate applicable to the year of issue (ranges from 3.5% to 4.0% and averages 3.5%) is used to demonstrate compliance with the minimum loss ratio requirements.
- g. Expenses have not been explicitly projected. Originally filed expense assumptions are assumed to remain appropriate, except that commissions are not paid on the increased premium.
- h. Dividends are not projected in the current experience as the company has not historically paid a dividend and does not anticipate paying a dividend in the future on its long-term care business in this filing.

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The above assumptions are based on the experience of the above-listed policy forms and similar forms issued by MassMutual, industry experience, and actuarial judgment. These assumptions are based on the nationwide experience of all standalone long-term care business issued by MassMutual at the time of development, which includes the 200-513 Series. The above assumptions are deemed reasonable for the policy forms in this filing and are considered "current" and "best estimate" (most likely without explicit margin) based on the experience used to develop the assumptions.

In establishing the assumptions described in this section, the policy design, underwriting, and claims adjudication practices for the above-listed policy forms were taken into consideration. Appendix A to this memorandum provides a description of the development of and justification for the assumptions used in this filing.

The company is not currently marketing standalone long-term care products. As a result, the requirement to reflect on any assumptions that deviate from those used for pricing other forms currently available for sale is not applicable.

7. Marketing Method

These policy forms were marketed by agents of MassMutual and/or by independent brokers.

8. Underwriting Description

These policies were individually underwritten with the use of various underwriting tools in addition to the application, which may have included cognitive screenings, phone interviews, face-to-face interviews, prescription drug profiles, motor vehicle records, paramedical exams, and attending physician statements.

9. Premiums

Premiums are unisex and payable for life. The premiums may vary by issue age, elimination period, benefit period, uninflated daily benefit amount, inflation option, payment mode, underwriting class, discounts (e.g., partner status), home care coverage, and the selection of any riders.

10. Issue Age Range

Issue ages are from 18 to 84.

11. Area Factors

Area factors are not used for these products.

12. Premium Modalization Rules

The following modal factors and percent distributions (based on the nationwide in-force insured count as of December 31, 2020) are applied to the annual premium (AP):

Table 12.1
Nationwide Modal Factors and Distribution

Premium Mode	Modal Factors	Percent Distribution
Annual	1.000*AP	54%
Semi-Annual	0.520*AP	4
Quarterly	0.265*AP	7
Monthly	0.088*AP	35

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13. Reserves

Active life reserves and reserves for the election of a CBUL have not been used in the experience exhibits for this rate increase analysis except as described in the supplement to the actuarial memorandum. Claim reserves as of December 31, 2020 have been discounted to the incurral date of each respective claim and included in historical incurred claims. Incurred but not reported (IBNR) reserves have not been used as the incurred claims include paid claim runout through 2021.

14. Trend Assumptions

As this is not medical insurance, an explicit medical cost trend is not included in the projections.

15. Demonstration of Satisfaction of Loss Ratio Requirements

Exhibit I provides actual and projected experience using the assumptions described in Section 6. Actual experience is provided from inception through 2020 (with claim runout through 2021) and then projected on a seriatim basis for 60 years. The actual and projected experience is based on nationwide premiums. The after-increase projected experience reflects the requested increase on a seriatim basis.

Values in Exhibit I are shown (a) before and (b) after the requested rate increase. Included are calendar year earned premiums, incurred claims, end of year lives, and annual loss ratios. As shown in Exhibit I, the anticipated lifetime loss ratio with the requested rate increase exceeds the minimum loss ratio required by pre-rate stability regulation.

The following table demonstrates that the lifetime loss ratios by inflation option also exceed the minimum loss ratio required by pre-rate stability regulation. The 'All' row corresponds to that shown in Exhibit I.

Table 15.1
Lifetime Loss Ratios by Inflation Option
Using Maximum Valuation Interest

Inflation Option	Before Increase	After Increase
All	75%	65%
Auto	77	65
None	65	65

Exhibit II provides a demonstration that the requested rate increase nationwide meets the 58%/85% minimum loss ratio test under moderately adverse conditions as required by rate stability regulation. Exhibit II shows that the sum of the accumulated value of incurred claims, without the inclusion of active life reserves, and the present value of projected incurred claims, without the inclusion of active life reserves, will not be less than the sum of the following:

1. Accumulated value of the initial earned premium times 58%,
2. 85% of the accumulated value of prior premium rate schedule increases,
3. Present value of projected initial earned premium times 58%, and
4. 85% of the present value of projected premium in excess of the projected initial earned premium.

Moderately adverse conditions are defined as any combination of deterioration in experience and/or assumptions that results in a deterioration in future experience. The projected incurred claims in Exhibit II were increased by 14% (equivalent to a 12.5% reduction to premiums) from the assumptions described above in Section 6 to reflect assumptions that include moderately adverse conditions.

The following table demonstrates that the 58%/85% test is passed by inflation option. The 'All' row corresponds to that shown in Exhibit II.

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Table 15.2
58%/85% Test by Inflation Option (\$ in millions)

Inflation Option	Item 5 ^[1]	Item 7 ^[2]	Result ^[3]
All	\$740	\$890	Pass
Auto	648	773	Pass
None	92	117	Pass

[1] Item 5 is the Lifetime Earned Premium Times Prescribed Factor.

[2] Item 7 is Lifetime Incurred Claims with Rate Increase.

[3] Test of whether Item 7 is not less than Item 5.

16. Actual-to-Expected Experience

The following table provides a comparison of actual and projected experience using the assumptions described in Section 6 to that expected using original pricing assumptions. Values in the following table are shown (a) before and (b) after the requested rate increase.

Table 16.1
Actual and Expected Loss Ratios by Inflation Option

Inflation Option	Lifetime Loss Ratio			Actual-to-Expected	
	Before Increase	After Increase	Expected ^[1]	Before Increase	After Increase
All	75%	65%	65%	1.16	1.00
Auto	77	65	65	1.19	1.00
None	65	65	64	1.01	1.01

[1] Projected actual policies sold from issue using original pricing assumptions. The expected loss ratio at the time of original pricing based on assumed sales mix and moderately adverse conditions was 60%.

Actual and projected experience in the above table is identical to that described in Exhibit I. Expected experience uses the actual policies sold and projects from issue on a seriatim basis using the original pricing assumptions. Consistent with the original pricing projections, the expected experience based on original pricing assumptions includes an adjustment for dividend margin assumed in pricing.

Exhibit III provides a summary of the original pricing assumptions that underlie the expected experience described above.

17. History of Previous Rate Revisions

Nationwide, this is the first request for a rate increase on this block of business. No prior rate increases have been implemented on the above-listed policy forms.

18. Analysis Performed to Consider a Rate Increase

Table 16.1 demonstrates that experience has been more adverse than that expected using original pricing assumptions as the actual-to-expected (A:E) loss ratios exceed 1.0. The adverse experience is driven by higher-than-expected persistency and morbidity.

To comply with rate stability regulation, an analysis of the projected loss ratio compared to that assumed at the time of original pricing revealed that experience has unfolded more than moderately adverse and crossed the original pricing threshold for which the company could consider a rate increase.

The original pricing threshold for which the company could consider a rate increase was a 60% lifetime loss ratio. The 60% lifetime loss ratio threshold reflects the original pricing assumptions based on the assumed sales mix under moderately adverse conditions. At the time of pricing, moderately adverse conditions were defined as deviations from pricing in any combination of morbidity, mortality, and lapse assumptions that result in an increase in the expected present value of the benefits by no more than

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12.5% of the expected present value of premium (equivalent to a 14% increase in claims). Table 16.1 demonstrates the lifetime loss ratio is in excess of this 60% threshold.

19. Average Annual Premium (Based on December 31, 2020 In-Force)

The number of insureds and the corresponding average annual premium that will be affected by this rate increase filing are shown in the table below.

Table 19.1
Average Annual Premium

Inflation Option	Number of Insureds	Before Increase Premium	After Increase Premium
Pennsylvania			
Auto	664	\$3,030	\$3,940
None	75	2,667	2,667
All	739	2,994	3,810
Nationwide			
Auto	14,119	\$3,209	\$4,171
None	3,451	2,485	2,485
All	17,570	3,067	3,840

20. Proposed Effective Date

This rate increase will apply to policies on their next policy anniversary date following at least a 60-day policyowner notification period following being filed for use by the department.

21. Distribution of Business as of December 31, 2020 (Based on Nationwide In-Force Insured Count)

Table 21.1
Nationwide Distributions of Business

Issue Ages	Percent Distribution		
	All	Auto	None
<40	1%	1%	1%
40-44	3	3	2
45-49	8	8	5
50-54	18	18	15
55-59	28	29	24
60-64	27	27	28
65-69	13	11	19
70-74	2	1	5
75-79	<1	<1	1
80+	0	0	0
Average Issue Age	58	57	59

Elimination Period	Percent Distribution		
	All	Auto	None
30-Day	1%	1%	3%
60-Day	1	1	2
90-Day	92	93	89
180-Day	5	5	6

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Benefit Period	Percent Distribution		
	All	Auto	None
2 Years	8%	8%	11%
3 Years	33	34	31
4 Years	17	18	14
5 Years	16	16	13
6 Years	25	24	31

Inflation Option	Percent Distribution		
	All	Auto	None
None	20%	0%	100%
Compound 3%	75	94	0
Compound 3.5%	1	1	0
Compound 5%	4	5	0

Premium Payment Duration	Percent Distribution		
	All	Auto	None
Lifetime Payment	100%	100%	100%
Limited Payment	N/A	N/A	N/A

Premium Payment Option	Percent Distribution		
	All	Auto	None
No Discounted Renewal	100%	100%	100%
Discounted Renewal	N/A	N/A	N/A

Coverage Type	Percent Distribution		
	All	Auto	None
Facility Only	1%	1%	2%
Comprehensive	99	99	98

Benefit Type	Percent Distribution		
	All	Auto	None
Reimbursement	100%	100%	100%
Indemnity	N/A	N/A	N/A

Underwriting Class ^[1]	Percent Distribution		
	All	Auto	None
Preferred	33%	34%	31%
Standard	52	52	52
Substandard	15	14	18

[1] At issue, the labels may have differed, but were grouped into these three generic labels.

Partner Status at Issue	Percent Distribution		
	All	Auto	None
Partnered	82%	82%	80%
Non-Partnered	18	18	20

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22. Number of Insureds and Annualized Premium (Based on December 31, 2020 In-Force)

The number of insureds and annualized premium that will be affected by this rate increase filing are shown in the table below.

Table 22.1
Number of Insureds and Annualized Premium

Inflation Option	Number of Insureds	Annualized Premium
Pennsylvania		
Auto	664	\$2,012,215
None	75	199,997
Total	739	2,212,212
Nationwide		
Auto	14,119	\$45,305,066
None	3,451	8,577,252
Total	17,570	53,882,317

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23. Actuarial Certification

I am a Principal and Consulting Actuary for Milliman, Inc. and retained by MassMutual to render an opinion with regard to long-term care insurance rates. I am a member of the American Academy of Actuaries. I meet the Academy's qualification standards to render this actuarial opinion and am familiar with the requirements for filing long-term care insurance premiums and rate increases.

This memorandum has been prepared in conformity with all applicable Actuarial Standards of Practice, including Actuarial Standards of Practice No. 8, "Regulatory Filings for Health Benefits, Accident and Health Insurance, and Entities Providing Health Benefits" and 18, "Long-Term Care" and other applicable standards.

I hereby certify that, to the best of my knowledge and judgment, this rate submission is in compliance with the applicable laws and regulations of this jurisdiction and the rules of the department of insurance. In my opinion, the rates are not excessive or unfairly discriminatory, and bear reasonable relationship to the benefits based on the loss ratio standards of this jurisdiction. If the requested premium rate schedule increase is implemented and the underlying assumptions, with moderately adverse conditions reflected, are realized, no further premium rate schedule increases are anticipated. Under moderately adverse conditions, a lifetime loss ratio of 74% is anticipated and becomes the threshold that must be crossed before additional rate increases may be considered in the future.

In forming my opinion, I have used actuarial assumptions and actuarial methods (which gave consideration to policy design, underwriting, and claim adjudication) and such tests of the actuarial calculations as I considered necessary. Based on these assumptions, or statutory requirements where necessary, the premium rate filing is in compliance with the loss ratio standards of this jurisdiction.

Certain models were developed to estimate the values included in this filing. The intent of the models was to estimate future experience. I have reviewed the models for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice.

I have relied on data and information provided by MassMutual and its third-party administrator to develop this filing, including but not limited to management's view of when a rate change may be considered, policy design, underwriting and claim adjudication process, seriatim in-force data, claim data, dividend expectation, and the company's long-term earnings rate. I have not audited or verified this data and information. If the underlying data or information is inaccurate or incomplete, the results of this filing may likewise be inaccurate or incomplete.

The basis for contract reserves has been previously filed and there is no anticipation of any changes.



Missy Gordon, FSA, MAAA
Principal and Consulting Actuary

Date: October 4, 2022

This filing has been prepared solely for the use and benefit of MassMutual. Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit any third-party recipient of its work product, even if Milliman consents to the release of its work product to such third party.

Milliman's work is being delivered to the department, in accordance with its statutory and regulatory requirements. Milliman recognizes that materials it delivers to the department may be public records subject to disclosure to third parties, however, Milliman does not intend to benefit and assumes no duty or liability to any third parties, including the department, who receive Milliman's work and may include disclaimer language on its work product so stating. The department agrees not to remove any such disclaimer language from Milliman's work. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, the department agrees that it shall not disclose Milliman's work product to third parties without Milliman's prior written consent; provided, however, that the department may distribute Milliman's work to (i) its professional service providers who are subject to a duty of confidentiality and who agree to not use Milliman's work product for any purpose other than to provide services to the department, or (ii) any applicable regulatory or governmental agency, as required.

A limited review was performed of the data used directly in this filing for reasonableness and consistency and no material defects in the data were found. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of this assignment.

Differences between the projections in this filing and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

Milliman recommends recipient be aided by its own actuary or other qualified professional when reviewing the Milliman work product.

Exhibit I-a
Massachusetts Mutual Life Insurance Company
Actual and Projected Experience by Calendar Year
Nationwide Experience Before Requested Rate Increase
513 Series

	Calendar Year	Without Interest			D	With Max. Val. Interest		
		A	B	C = B / A		E	F	G = F / E
		Earned Premium	Incurred Claims	Incurred Loss Ratio		End of Year Lives	Earned Premium	Incurred Claims
Historical Experience	2012	624	0	0%	4	871	0	0%
	2013	2,099,316	0	0%	1,818	2,717,790	0	0%
	2014	9,683,841	399,158	4%	4,776	12,110,887	499,180	4%
	2015	19,563,441	6,250	0%	8,271	23,638,715	7,552	0%
	2016	30,078,471	277,312	1%	11,501	35,114,855	323,743	1%
	2017	38,389,838	861,484	2%	13,909	43,302,168	971,714	2%
	2018	45,656,804	526,091	1%	16,063	49,757,398	573,340	1%
	2019	51,395,990	653,236	1%	17,282	54,117,840	687,830	1%
	2020	53,371,273	1,426,681	3%	17,570	54,297,265	1,451,434	3%
Projected Future Experience	2021	53,306,876	2,059,715	4%	17,256	52,397,774	2,024,586	4%
	2022	52,332,944	2,672,693	5%	16,991	49,700,869	2,538,262	5%
	2023	51,484,974	3,426,550	7%	16,763	47,242,027	3,144,145	7%
	2024	50,721,602	4,326,285	9%	16,555	44,967,653	3,835,473	9%
	2025	50,000,847	5,383,890	11%	16,355	42,829,583	4,611,671	11%
	2026	49,288,306	6,613,691	13%	16,158	40,791,495	5,473,492	13%
	2027	48,554,288	8,049,698	17%	15,954	38,825,099	6,436,630	17%
	2028	47,781,261	9,719,408	20%	15,738	36,914,915	7,508,916	20%
	2029	46,954,013	11,655,457	25%	15,509	35,049,052	8,700,117	25%
	2030	46,063,053	13,898,028	30%	15,264	33,221,222	10,023,216	30%
	2031	45,100,999	16,482,147	37%	15,000	31,427,396	11,484,869	37%
	2032	44,062,574	19,439,932	44%	14,717	29,665,488	13,087,767	44%
	2033	42,943,239	22,792,140	53%	14,412	27,934,176	14,825,703	53%
	2034	41,738,823	26,545,704	64%	14,084	26,232,564	16,683,364	64%
	2035	40,446,168	30,683,172	76%	13,731	24,560,514	18,631,567	76%
	2036	39,063,994	35,153,152	90%	13,351	22,919,033	20,624,022	90%
	2037	37,592,500	39,882,268	106%	12,943	21,309,854	22,607,320	106%
	2038	36,033,879	44,837,131	124%	12,505	19,735,582	24,556,631	124%
	2039	34,392,435	49,911,407	145%	12,039	18,199,587	26,411,360	145%
	2040	32,675,296	55,002,921	168%	11,544	16,706,208	28,121,418	168%
	2041	30,892,799	59,920,153	194%	11,021	15,260,732	29,599,518	194%
	2042	29,057,790	64,523,168	222%	10,473	13,868,851	30,795,526	222%
	2043	27,184,633	68,740,540	253%	9,903	12,536,063	31,699,009	253%
	2044	25,288,595	72,409,542	286%	9,315	11,267,361	32,261,810	286%
	2045	23,386,460	75,404,496	322%	8,713	10,067,504	32,460,150	322%
	2046	21,495,854	77,704,576	361%	8,102	8,940,706	32,319,154	361%
	2047	19,633,997	79,147,700	403%	7,489	7,890,158	31,806,197	403%
	2048	17,817,688	79,700,345	447%	6,878	6,918,121	30,945,230	447%
	2049	16,062,364	79,416,495	494%	6,276	6,025,680	29,792,307	494%
	2050	14,381,867	78,260,992	544%	5,688	5,212,807	28,366,065	544%
	2051	12,788,034	76,375,245	597%	5,119	4,478,370	26,746,441	597%
	2052	11,290,503	73,670,632	653%	4,576	3,820,227	24,926,848	652%
	2053	9,897,160	70,375,494	711%	4,061	3,235,536	23,006,697	711%
	2054	8,612,791	66,526,275	772%	3,578	2,720,441	21,012,896	772%
	2055	7,440,135	62,285,101	837%	3,130	2,270,576	19,008,032	837%
	2056-2060	23,440,565	241,598,954	1,031%	10,206	6,535,160	67,029,015	1,026%
2061-2065	9,110,762	133,578,726	1,466%	4,253	2,144,074	31,293,694	1,460%	
2066-2070	2,908,842	58,729,115	2,019%	1,474	577,869	11,621,896	2,011%	
2071-2075	757,970	20,161,334	2,660%	421	127,107	3,370,335	2,652%	
2076-2080	162,068	5,418,363	3,343%	100	22,931	764,660	3,335%	
History		250,239,599	4,150,213	2%	275,057,788		4,514,791	2%
Future		1,202,148,947	1,952,482,634	162%	784,550,362		790,156,009	101%
Lifetime		1,452,388,546	1,956,632,846	135%	1,059,608,150		794,670,800	75%

Exhibit I-b
Massachusetts Mutual Life Insurance Company
Actual and Projected Experience by Calendar Year
Nationwide Experience After Requested Rate Increase
513 Series

	Calendar Year	Without Interest			D End of Year Lives	With Max. Val. Interest		
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio		E Earned Premium	F Incurred Claims	G = F / E Incurred Loss Ratio
Historical Experience	2012	624	0	0%	4	871	0	0%
	2013	2,099,316	0	0%	1,818	2,717,790	0	0%
	2014	9,683,841	399,158	4%	4,776	12,110,887	499,180	4%
	2015	19,563,441	6,250	0%	8,271	23,638,715	7,552	0%
	2016	30,078,471	277,312	1%	11,501	35,114,855	323,743	1%
	2017	38,389,838	861,484	2%	13,909	43,302,168	971,714	2%
	2018	45,656,804	526,091	1%	16,063	49,757,398	573,340	1%
	2019	51,395,990	653,236	1%	17,282	54,117,840	687,830	1%
	2020	53,371,273	1,426,681	3%	17,570	54,297,265	1,451,434	3%
Projected Future Experience	2021	53,306,876	2,048,066	4%	17,256	52,397,774	2,013,136	4%
	2022	52,332,944	2,657,224	5%	16,991	49,700,869	2,523,570	5%
	2023	53,146,820	3,402,879	6%	16,681	48,766,920	3,122,426	6%
	2024	60,787,154	4,274,373	7%	16,394	53,891,340	3,789,451	7%
	2025	61,077,599	5,314,578	9%	16,196	52,317,668	4,552,301	9%
	2026	60,214,049	6,527,348	11%	16,000	49,833,740	5,402,035	11%
	2027	59,325,456	7,943,224	13%	15,798	47,437,957	6,351,494	13%
	2028	58,389,734	9,588,972	16%	15,584	45,110,813	7,408,146	16%
	2029	57,388,130	11,496,499	20%	15,357	42,837,638	8,581,465	20%
	2030	56,308,809	13,704,976	24%	15,113	40,610,572	9,883,989	24%
	2031	55,142,718	16,248,740	29%	14,851	38,424,682	11,322,231	29%
	2032	53,883,167	19,159,044	36%	14,570	36,277,271	12,898,664	36%
	2033	52,524,437	22,456,041	43%	14,268	34,166,645	14,607,081	43%
	2034	51,061,259	26,146,005	51%	13,942	32,091,641	16,432,165	51%
	2035	49,489,577	30,211,262	61%	13,591	30,052,020	18,345,015	61%
	2036	47,807,640	34,600,930	72%	13,214	28,048,963	20,300,042	72%
	2037	46,015,586	39,242,359	85%	12,808	26,084,594	22,244,591	85%
	2038	44,115,978	44,102,370	100%	12,374	24,162,101	24,154,218	100%
	2039	42,113,965	49,075,946	117%	11,911	22,285,615	25,969,269	117%
	2040	40,018,215	54,062,172	135%	11,419	20,460,485	27,640,445	135%
	2041	37,841,323	58,873,080	156%	10,900	18,693,228	29,082,287	156%
	2042	35,599,044	63,371,426	178%	10,357	16,990,889	30,245,830	178%
	2043	33,309,020	67,487,124	203%	9,792	15,360,291	31,121,014	203%
	2044	30,990,036	71,060,440	229%	9,208	13,807,641	31,660,728	229%
	2045	28,662,688	73,969,081	258%	8,611	12,338,834	31,842,237	258%
	2046	26,348,636	76,193,530	289%	8,006	10,959,108	31,690,678	289%
	2047	24,069,080	77,575,594	322%	7,398	9,672,447	31,174,436	322%
	2048	21,844,708	78,083,350	357%	6,792	8,481,701	30,317,403	357%
	2049	19,694,525	77,771,136	395%	6,196	7,388,258	29,175,069	395%
	2050	17,635,590	76,605,706	434%	5,614	6,392,140	27,766,101	434%
	2051	15,682,507	74,726,630	476%	5,052	5,492,013	26,169,101	476%
	2052	13,847,177	72,048,087	520%	4,514	4,685,297	24,377,853	520%
	2053	12,139,340	68,794,582	567%	4,005	3,968,540	22,489,877	567%
	2054	10,564,911	65,002,358	615%	3,527	3,337,039	20,531,556	615%
	2055	9,127,287	60,830,638	666%	3,084	2,785,460	18,564,163	666%
	2056-2060	28,763,505	235,655,358	819%	10,051	8,019,126	65,382,038	815%
	2061-2065	11,185,009	129,996,190	1,162%	4,182	2,632,201	30,455,365	1,157%
	2066-2070	3,571,610	57,011,153	1,596%	1,447	709,536	11,282,328	1,590%
	2071-2075	930,174	19,517,051	2,098%	413	155,986	3,262,747	2,092%
	2076-2080	198,871	5,232,308	2,631%	98	28,138	738,418	2,624%

History	250,239,599	4,150,213	2%	275,057,788	4,514,791	2%
Future	1,436,455,155	1,912,067,831	133%	926,857,180	774,870,961	84%
Lifetime	1,686,694,755	1,916,218,044	114%	1,201,914,968	779,385,752	65%

Projected incurred claims in 2021 and 2022 are different from those in the before increase projections due to an immaterial modeling simplification in the application of the assumed reduced benefit option elections.

Exhibit II
Demonstration that the Requested Rate Increase Passes the 58%/85% Loss Ratio Minimum
Massachusetts Mutual Life Insurance Company
513 Series Nationwide Experience

1	Accumulated value of initial earned premium	275,057,788	x	58%	=	159,533,517
2a	Accumulated value of earned premium	275,057,788				
2b	Accumulated value of prior premium rate schedule increases (2a - 1)	0	x	85%	=	0
3	Present value of future projected initial earned premium	768,275,604	x	58%	=	445,599,850
4a	Present value of future projected premium	926,857,180				
4b	Present value of future projected premium in excess of the projected initial earned premiums (4a - 3)	158,581,576	x	85%	=	134,794,340
5	Lifetime Earned Premium Times Prescribed Factor: Sum of 1, 2b, 3, and 4b					739,927,707
6a	Accumulated value of incurred claims without the inclusion of active life reserves					4,514,791
6b	Present value of future projected incurred claims without the inclusion of active life reserves					885,566,813
7	Lifetime Incurred Claims with Rate Increase: Sum 6a and 6b					890,081,604
8	Test: 7 is not less than 5					Pass
<p>Items 2a, 4a, and 6a are consistent with the accumulated and present values shown in Exhibit I-b.</p> <p>All accumulated or present values use the maximum valuation interest rate for contract reserves applicable to the year of issue, which ranges from 3.5% to 4.0% and averages 3.5%.</p> <p>Item 3 reflects the impact of CBUL and RBO to align persistency with that in Item 4a.</p> <p>Item 6b is 14% higher than incurred claims shown in Exhibit I-b to reflect moderately adverse conditions.</p>						

Exhibit III
Massachusetts Mutual Life Insurance Company
Original Pricing Assumptions
513 Series

Morbidity

The morbidity assumption was derived using industry experience as reported in the Intercompany Study 1984-2004 published by the Society of Actuaries Long Term Care Experience Committee (2004 Study) and adjusted, to the extent credible, by the aggregate experience of the company's reinsurer.

Mortality

A2000 Mortality table is used for active lives along with adjustments by attained age and gender. The disabled mortality assumption is derived using industry experience as reported in the 2004 Study.

Lapse Rates

Voluntary lapse rates vary by duration and issue age.

Duration	Lifetime-Payment Lapse Rates									
	Issue Ages									
	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	8.60%	4.50%	3.70%	3.55%	2.85%	3.50%	3.50%	3.85%	4.05%	3.55%
2	5.55%	4.15%	3.60%	2.90%	2.40%	2.35%	2.75%	3.15%	3.00%	3.10%
3	3.55%	3.00%	2.25%	2.10%	1.80%	1.85%	1.95%	1.95%	2.05%	2.05%
4	3.30%	2.05%	2.15%	1.70%	1.50%	1.55%	1.60%	1.80%	1.85%	1.75%
5	2.15%	1.95%	1.70%	1.35%	1.05%	1.00%	1.20%	1.15%	1.20%	1.35%
6	2.15%	1.95%	1.60%	1.10%	1.00%	1.00%	1.10%	1.15%	1.15%	1.25%
7	2.15%	1.95%	1.60%	1.10%	1.00%	1.00%	1.10%	1.15%	1.15%	1.25%
8	1.35%	1.35%	1.25%	1.05%	0.95%	0.90%	0.95%	1.05%	1.00%	1.00%
9	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%
10	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%
11+	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%

Benefit Expiry Rates

An explicit benefit expiry assumption was not included in the original pricing memoranda.

Interest Rate

3.5% maximum valuation rate

Improvement

An annual improvement assumption was not included in pricing.

Appendix A

Development and Justification of Assumptions Used in this Filing

This appendix describes the development of, and justification for, the actuarial assumptions used in this filing.

The persistency and morbidity assumptions were developed using historical experience of MassMutual policies. Where actual experience had low credibility or did not exist, industry experience and actuarial judgment was also used. Historical experience through 2018 was used in the assumption development and morbidity experience included claim runout through 2019. Experience on all of MassMutual's standalone long-term care (LTC) products available at the time of development was combined in determining the assumptions described herein. Due to this pooling, not all product attributes and related assumptions described below may apply to this filing.

The persistency and morbidity assumptions were developed on a first principles basis. In this context, "first principles" means developing key assumptions (namely, morbidity and mortality) at the component level and modeling active and disabled lives separately. Separate assumptions were developed for: (1) claim incidence, (2) voluntary lapse, (3) active mortality, (4) claim termination (including separate assumptions for disabled mortality and recovery), and (5) utilization. For each assumption except utilization, experience from 2009 through 2018 with runout through 2019 was used. The utilization assumption was developed based on historical experience from 2015 through September 30, 2019 with runout through December 31, 2019 to capture more recent information as cost of care and utilization trends can fluctuate over short periods of time. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below.

As an additional consideration, the COVID-19 pandemic has created uncertainty regarding future LTC experience. However, due to the long duration nature of LTC insurance, minor deviations in experience over a relatively small number of calendar years are not expected to have a significant impact on lifetime projections. Therefore, no adjustments were made to these assumptions to capture anticipated impacts of the pandemic. However, emerging experience and trends will continue to be monitored so that adjustments can be included in the future if believed to be representative of long-term trends.

The rate increase dependent assumptions were developed using historical experience and actuarial judgment where experience was limited or did not exist. A nationwide rate increase was filed for 200-511 Series beginning in 2018 such that this experience and considerations for these prior rate increases are described as applicable in the sections that follow.

The sections that follow provide more detail on the development of and justification for the assumptions used in the projections in this filing.

Active Assumptions

The assumptions for active (i.e., healthy) lives were developed based on MassMutual's historical experience from 2009 through 2018, with runout through 2019. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below. The active assumptions include (1) claim incidence (the probability that an active life becomes disabled), (2) voluntary lapse, and (3) active mortality.

Claim Incidence

Claim incidence probabilities (i.e., the probability of an insured becoming disabled) were developed using the 2017 Milliman *Long-Term Care Guidelines (Guidelines)* incidence curves with adjustments for retrospective morbidity improvement. These assumptions were developed based on the following three starting sites of care—assisted living facility (ALF), home health care (HHC), or skilled nursing facility (SNF).

Exhibit A-1 provides a summary of actual-to-expected (A:E) experience by site of care for claim incidence in policy durations 7 and later for each characteristic by which the claim incidence assumption varies. The following items are included:

- Exposure [A] reflects the length of time a covered life is exposed to the risk of becoming disabled (i.e., an exact exposure basis).
- Claim counts [B] are based on historical claim experience and are provided by situs.
- A:E ratios are calculated as actual claim incidence probabilities to the *Guidelines* with a retrospective morbidity improvement adjustment [C] and to the assumption used in this filing [D]. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

Appendix A

Development and Justification of Assumptions Used in this Filing

Lifetime Payment Voluntary Lapse

The voluntary lapse assumption for policies with a lifetime payment option, without a discounted renewal payment option, uses the base lapse probabilities underlying the all-lives assumption used in the company's 2018 rate increase filings, which varied by policy duration and partner status at issue (i.e., partnered versus non-partnered). This prior assumption was developed for use with an all-lives exposure base (i.e., including both active and disabled insureds); however, it is considered an appropriate expected basis for an active assumption because lapses due to benefit expiry were explicitly removed from the prior study and the ultimate lapse probability was assumed to be constant (rather than decreasing).

The attained age adjustment factors developed from the predictive model produced a U-shaped pattern (i.e., decreased and then increased) by attained age. However, the attained age adjustment factors are held constant for attained ages less than 50 and for attained ages 70 and older to produce an ultimate voluntary lapse assumption that is constant rather than increasing by attained age. The adjustments are held constant after this point because an increasing attained age lapse trend is not widely used in the industry, and this increasing lapse trend may be due to miscoding of deaths or underreporting of deaths in the Social Security Death Master File. An additional attained age adjustment to mortality was developed (Exhibit A-3a) to capture these terminations (i.e., higher lapses at older attained ages) such that the combined mortality and voluntary lapse assumption better aligns with actual experience as shown in Exhibit A-4.

Exhibit A-2 supports the voluntary lapse assumption and provides the following information by benefit period (non-lifetime or lifetime), inflation protection option (auto or none), payment method (with or without discounted renewal payment option), and attained age.

- Exhibit A-2a provides the ultimate voluntary lapse probabilities after all experience adjustments. These ultimate voluntary lapse probabilities are applicable for attained ages 70 and older in policy durations 9 and later.
- Exhibit A-2b provides A:E experience and includes the following:
 - Exposure [A] reflects the length of time a covered life is exposed to the risk of voluntary lapse (i.e., exact exposure basis).
 - Actual lapses [B].
 - A:E ratios are calculated as actual lapse probabilities to the unadjusted voluntary lapse assumption used in the company's nationwide 2018 rate increase filings [C], the assumption with experience adjustments directly from the predictive model (i.e., without the attained age caps) [D], and the assumption used in this filing (i.e., with the attained age caps) [E]. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience. Additionally, the A:E in column [E] is greater than 1.0 due to the reallocation of lapses at higher attained ages as described above.

The experience underlying Exhibit A-2b captures policies with a lifetime payment option, without a discounted renewal payment option, for policy durations 9 and later to focus on the fit of the ultimate voluntary lapse assumption and excludes "shock" lapses. For all cohorts except the 513 Series, there have been prior rate increases, and thus the option to lapse with a contingent benefit (a.k.a., shock lapse). Policyowners that elected a contingent benefit upon lapse (CBUL) were not counted as a voluntary lapse; however, their annual policy exposure was valued up to the date of election. That said, the number of rate increases approved prior to December 31, 2018 is limited and considered immaterial to the development of this assumption.

Discounted Renewal or Limited Payment Voluntary Lapse

For policies with a discounted renewal payment option and/or limited payment option, the voluntary lapse assumption is a function of the voluntary lapse probabilities for policies with a lifetime payment option, without a discounted renewal payment option. The discounted renewal payment option and limited payment option lapse adjustments are unchanged from the all-lives assumption used in the company's 2018 rate increase filings and were validated using sensitivity testing analysis in lieu of leveraging predictive analytics or traditional A:E studies. Based on this sensitivity testing, the impact of adjustments to the discounted renewal payment option and limited payment option voluntary lapse assumptions on the projections is immaterial.

Appendix A

Development and Justification of Assumptions Used in this Filing

Active Mortality

Active mortality was developed based on the 2012 Individual Annuity Mortality table (2012IAM) with adjustments to make it applicable to an active-life exposure base and reflect retrospective active mortality improvement. Experience adjustment factors were developed using predictive analytics with additional adjustments to increase mortality for ages 70 and older commensurate with the capping applied for voluntary lapse mentioned above.

Exhibit A-3 supports the active mortality assumption and provides the following information by policy duration, sex, partner status, attained age, and underwriting class:

- Exhibit A-3a provides the adjustment factors that are to be applied to the 2012IAM hazard rates; the adjusted hazard rates are converted back into mortality probabilities to create the adjusted mortality assumption. The attained age adjustment factors are applicable to policy durations 7 and later.
- Exhibit A-3b provides A:E results for business in policy durations 7 and later, and includes the following:
 - Exposure [A] reflects the length of time a covered life is exposed to the risk of death (i.e., exact exposure basis).
 - Actual deaths of active insureds [B].
 - A:E ratios are calculated as actual mortality probabilities to the unadjusted active 2012IAM mortality probabilities with a retrospective mortality improvement adjustment [C], the assumption with experience adjustments directly from the predictive model (i.e., without the composite termination attained age adjustments) [D], and the assumption used in this filing (i.e., with the composite termination attained age adjustments) [E]. This fit will not be perfect (i.e., ratio deviates from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience. Additionally, the A:E in column [E] is less than 1.0 due to the reallocation of lapses at higher attained ages as described above.

Composite Policy Terminations

Exhibit A-4 supports the active composite termination (i.e., active mortality and voluntary lapse combined) assumption. It provides an A:E comparison of the composite termination experience and includes the following:

- Exposure [A] reflects the length of time a covered life is exposed to the risk of termination (i.e., exact exposure basis).
- Actual composite terminations of active insureds [B].
- A:E ratios are calculated as actual termination probabilities to the expected composite termination probabilities [C]. The A:E provides an indication of fit. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

The experience underlying Exhibit A-4 reflects policies with a lifetime payment option, without a discounted renewal payment option, for policy durations 9 and later to focus on the fit of the ultimate composite termination assumption. It also excludes “shock” lapses as described above for Exhibit A-2b.

Disabled Assumptions

The assumptions for disabled (i.e., on-claim) lives were developed based on detailed historical experience from 2009 through 2018 with runout through 2019. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below. The disabled assumptions include (1) disabled mortality and (2) recovery. A composite claim termination assumption was also developed and used to derive an implied recovery assumption, as described below.

Disabled Mortality

Disabled mortality probabilities were developed based on the disabled mortality tables developed in conjunction with the *Guidelines* with adjustments to reflect experience from 2009 through 2018 with runout through 2019. The

Appendix A

Development and Justification of Assumptions Used in this Filing

experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below.

Exhibit A-5 provides a summary of A:E results for experience in claim months 4 through 96 for each characteristic by which the disabled mortality assumption varies (starting site of care, sex, benefit period, partner status, payment type, claim duration, and incurred age) and includes the following:

- Exposure [A] reflects the length of time a disabled insured is exposed to the risk of death (i.e., exact exposure basis).
- Actual deaths [B] of disabled insureds.
- A:E ratios are calculated as actual deaths of disabled insureds to the unadjusted disabled mortality tables developed in conjunction with the *Guidelines* [C] and the disabled mortality assumption used in this filing [D]. The A:E provides an indication of fit. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

Implied Recovery

Implied recovery probabilities were developed from the composite claim termination (described below) and disabled mortality assumptions using the following formula:

$$\text{Implied Recovery Probability} = 1 - [(1 - \text{Claim Termination Probability}) / (1 - \text{Disabled Mortality Probability})]$$

Minor smoothing was applied to ensure that the resulting recovery probabilities were reasonable by claim month and across key claimant characteristics.

Exhibit A-6 provides a summary of A:E results for experience in claim months 4 through 96 for each characteristic by which the implied recovery assumption varies (starting site of care, sex, benefit period, partner status, payment type, claim duration, and incurred age) and includes the following:

- Exposure [A] reflects the length of time a disabled insured is exposed to the opportunity of recovery (i.e., exact exposure basis).
- Actual recoveries [B] of disabled insureds.
- A:E ratios are calculated as actual recoveries of disabled insureds to the recovery tables developed in conjunction with the *Guidelines* [C] and the implied recovery assumption used in this filing [D]. The *Guidelines* A:E result is included for illustrative purposes only as this expected basis was not directly used in developing the implied recovery assumption.

Composite Claim Terminations

Composite claim termination probabilities were developed using the *Guidelines* with adjustments to reflect experience from 2009 through 2018 with runout through 2019. The experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below.

Exhibit A-7 provides a summary of A:E results for experience in claim months 4 through 96 for each characteristic by which the composite claim termination assumption varies (starting site of care, sex, benefit period, partner status, payment type, claim duration, and incurred age) and includes the following:

- Exposure [A] reflects the length of time a disabled insured is exposed to the risk of claim termination (i.e., exact exposure basis).
- Actual terminations [B] of disabled insureds.
- A:E ratios are calculated as actual claim terminations to the unadjusted *Guidelines* claim termination tables [C] and the claim termination assumption used in this filing [D]. The A:E provides an indication of fit. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

Appendix A

Development and Justification of Assumptions Used in this Filing

Utilization Assumption

Utilization recognizes that less than the full potential benefit may be paid for an LTC claim due to services received less frequently than daily ("day" utilization) or actual charges less than the daily maximum ("dollar" utilization). The utilization assumption is a "total" utilization assumption—that is, it captures the impact of both day and dollar utilization. The utilization assumption was developed based on historical experience from 2015 through September 30, 2019 with runout through December 31, 2019.

For MassMutual's in-force business that pays services on a reimbursement basis, total utilization was split into two components (1) policy duration utilization and (2) claim duration utilization.

Policy Duration Utilization

Total policy duration utilization was developed using the *Guidelines* utilization projection model with inputs based on MassMutual's actual utilization percentages and cost of care trends.

The policy duration utilization assumption also captures how utilization by site of care changes over time due to (1) inflation of the daily benefit and (2) cost of care trends.

The policy duration utilization assumption produced using these assumptions and the *Guidelines* utilization projection model were then used as the underlying expectation for the claim duration utilization analysis described below.

Claim Duration Utilization

Total utilization by claim duration was developed based on the policy duration utilization assumption described above with adjustments for MassMutual's actual claim experience by starting site of care. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below, with additional adjustments to trend the utilization assumption towards an ultimate level in late claim durations where experience was limited.

Exhibit A-8 supports the claim duration total utilization assumption for policies that pay services on a reimbursement basis and provides the following information by starting site of care, claim duration month, benefit period (non-lifetime or lifetime), inflation protection option (auto or none), and incurred age.

- Exhibit A-8a provides the claim duration adjustment factors described above.
- Exhibit A-8b provides A:E results for experience in claim months 4 through 96 and includes the following:
 - Actual paid claims [A].
 - A:E ratios are shown separately for the policy duration utilization assumption described above [B] and the utilization assumption used in this filing [C]. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience. Additionally, as seen in Exhibit A-8b, the trend adjustments applied move the overall fit for claim years 5 and later further from 1.00 as this is the point at which the trend adjustments are applied to the assumption.

For MassMutual's in-force business that pays services on an indemnity basis, an explicit day utilization assumption was developed based on the days of care used only. Indemnity business has dollar utilization of 100%; therefore, its total utilization assumption is equal to the day utilization. Exhibit A-9 provides information like Exhibit A-8, except for policies that pay services on an indemnity basis.

Prospective Improvement

No prospective improvement is assumed for any assumption.

Appendix A
Development and Justification of Assumptions Used in this Filing

Rate Increase Dependent Assumptions

At the time of a rate increase, policyowners have options to elect a CBUL or reduced benefit options (RBO). Adverse selection is assumed relative to CBUL and RBO elections. These policyowner behavior assumptions are provided below and were developed primarily based on MassMutual's actual CBUL and RBO election rate experience and actuarial judgment—particularly at the higher rate increase magnitudes where limited experience exists.

Contingent Benefit Upon Lapse Election Rates

A CBUL election rate is determined as a function of the magnitude of the rate increase. The assumption is applied on a seriatim basis based on the cumulative increase as shown in the following table. The total CBUL election rate is then prorated between the prior approved increase, if applicable, and the requested increase.

Cumulative Rate Increase	CBUL Assumption
0-14%	0.0%
15-100%	Rate Increase x 4.0%
>100%	(Rate Increase -100%) x 2.0% + 4.0%

No CBUL elections are assumed for policies with a limited payment option.

Reduced Benefit Options

It is assumed that those electing RBO will reduce their benefits so that premiums after the increase are closer to those before the increase. The percent reduction in premium is assumed to correspond to an equivalent percent reduction in claims. The RBO election rate is based on the CBUL election rate. The RBO election rate is assumed to be 6 times the CBUL election rate (i.e., 6.0 multiplied by CBUL election) for cumulative rate increases greater than 15%. Because the RBO election rate is based on the CBUL election rate; no RBO is assumed for cumulative increases less than or equal to 15% or for policies with a limited payment option. The RBO election rate is then capped at 40%.

Based on the RBO election function, the reduction to premium and claims can then be determined as follows:

Reduction to premium and claims due to the election of RBO
= $1 - (\text{Average premium level after the cumulative rate increase with RBO election} / \text{Premium level after the full cumulative rate increase without any RBO election})$, where

Average premium level after the cumulative rate increase with RBO election
= weighted average premium level of the assumed percentage of policyowners electing RBO with the percentage assumed to accept the full cumulative rate increase

Adverse Selection

The adverse selection assumption is a function of the CBUL and RBO election rates such that the relative increase to morbidity due to adverse selection varies by the cumulative rate increase's magnitude. The percentage increase in morbidity due to adverse selection was developed from the following formula and actuarial judgment. It is assumed that at the time of the rate increase, policyowners that elect a CBUL will be selective in that their relative morbidity is 25% lower than that of the remaining pool. Similarly, it is assumed that at the time of the rate increase, policyowners that elect an RBO will be selective in that their relative morbidity is 12.5% lower than that of the remaining pool.

$\text{PoolMorb} = \text{AdvSelMorb} \times (1 - \text{CBUL} - \text{RBO}) + [(1 - 25\%) \times \text{AdvSelMorb}] \times \text{CBUL} + [(1 - 12.5\%) \times \text{AdvSelMorb}] \times \text{RBO}$, where

PoolMorb = morbidity of the pool before the rate increase = 1.0
AdvSelMorb = adverse morbidity of the remaining pool after the rate increase due to selective lapses
CBUL = percentage of policyowners that elect CBUL
RBO = percentage of policyowners that elect RBO

Solving the above for the adverse selection component results in the following formula:

$\text{Adverse Selection} = 1 / (1 - 25\% \times \text{CBUL} - 12.5\% \times \text{RBO})$

Appendix A

Development and Justification of Assumptions Used in this Filing

Predictive Analytics

In developing the experience adjustment factors described above, predictive analytics was employed in the form of a penalized generalized linear model (GLM) as well as a gradient boosting machine (GBM) model.

Penalized Generalized Linear Model

A penalized GLM was used to develop adjustments for (1) situs-specific incidence, (2) lifetime payment option voluntary lapse, (3) active mortality, (4) on-claim utilization, and (5) day utilization.

A penalized GLM is like a traditional GLM. The key difference is that it adds an additional constraint that penalizes the size of the model's coefficients to control overfitting the model to the historical data. This penalty placed on the coefficients can be seen as a credibility lever which controls how much weight is given to the company's actual experience. A high penalty would give no weight to the data, leaving the benchmark assumption (e.g., *Guidelines*) unadjusted. No penalty would give full weight to the company's historical data, potentially making large adjustments to the benchmark assumption, which could be overfitting the historical experience. Therefore, when using a penalized GLM it is important to choose a penalty that gives the right amount of weight to the actual data to avoid underfitting or overfitting the experience. A standard approach for choosing such a penalty is to use a k-fold cross-validation (described below) to test a series of penalty values.

Gradient Boosting Machine

GBM models were used to develop adjustments for (1) composite claim termination and (2) disabled mortality. As part of our experience analyses, GBM models were also used to explore key drivers for certain assumptions which informed our decisions regarding assumption complexity, the predictive modeling technique(s) to use in developing adjustments, and the variables to capture in the experience analyses.

A GBM model is a nonparametric algorithm that uses an ensemble of decision trees to develop predictions which automatically create key interactions of the independent variables in the model to minimize the prediction error of the model (i.e., the difference between the actual versus predicted counts). At each decision point in the trees, the model cycles through each variable and chooses the optimal data split that minimizes the prediction error. This process determines variable importance and how to partition variables such that the model can navigate complex interactions in an automated fashion.

A GBM model includes several inputs that control the model complexity and learning process, which are referred to as hyperparameters. These inputs are used to produce a model that determines the amount of weight to place on the historical data (i.e., not overfitting or underfitting) such that it will generalize well to future experience. A standard approach for tuning such hyperparameters is to use a k-fold cross-validation (described below).

K-Fold Cross-Validation

A k-fold cross-validation is an automated process by which model hyperparameters can be selected and evaluated. This process splits the data into "k" subsets and iteratively trains and tests the model independently on each subset of the data. This process gives an estimation of how well a model will generalize to new data that was not used to develop assumptions. Through the k-fold cross-validation the impact that hyperparameters had on a model's ability to predict on the unseen data was evaluated by testing a range of hyperparameters. Hyperparameters were selected to balance minimizing the k-fold cross-validation prediction error with the generalizability of the model. This allows for a robust and automated approach to determine the amount of weight to give actual experience versus the benchmark assumptions.

Hazard Rates and Probabilities

Each assumption consists of a base assumption and experience adjustment factors. The base assumption was converted to a hazard rate for use in predictive modeling. The experience adjustment factors are applied to the base hazard rate. The assumption is then converted back to a probability for use in projection. Adjustment factors were developed to be applied to hazard rates as part of the predictive modeling process described above. Hazard rates are converted from the base probability assumption and equal $-\text{LN}[1-\text{probability}]$. After applying all applicable adjustments, adjusted hazard rates are converted back to probabilities to create the assumption, where probability = $1 - \text{EXP}[-\text{hazard rate}]$.

A hazard rate represents the instantaneous likelihood (rate per unit of time) of an event (i.e., incidence, death, lapse, or recovery) at different times, whereas the probability is the likelihood that an event will occur within a specific time

Appendix A
Development and Justification of Assumptions Used in this Filing

interval (e.g., one policy year). Because exact exposure is used in the predictive model, hazard rates were used in the development. They are then converted to probabilities for use in the projection models. Please note that this conversion of probabilities to hazard rates is only applicable for assumptions that follow a Poisson distribution (i.e., whether an event occurs) and as such are not applicable to the claim duration utilization assumption and indemnity day utilization assumption, which are non-binary (i.e., based on dollars and days, respectively, versus events).

Exhibit A-1
Actual-to-Expected Claim Incidence Experience 2009-2018
Policy Durations 7+
All Rate Series Combined

Policy or Insured Characteristic	Exposure [A]	ALF			HHC			SNF			Total		
		Claim Count [B]	Actual-to-Expected (A:E)		Claim Count [B]	A:E		Claim Count [B]	A:E		Claim Count [B]	A:E	
			2017 <i>Guidelines</i> [C]	Expected ^[1] [D]		2017 <i>Guidelines</i> [C]	Expected ^[1] [D]		2017 <i>Guidelines</i> [C]	Expected ^[1] [D]		2017 <i>Guidelines</i> [C]	Expected ^[1] [D]
Sex													
Female	259,872	309	1.00	0.96	839	1.07	1.03	139	0.39	0.69	1,286	0.88	0.95
Male	205,434	180	1.22	1.12	520	1.08	1.01	114	0.46	0.81	814	0.92	0.99
Partner Status													
Partnered	341,646	210	0.98	0.96	811	1.21	1.09	119	0.39	0.70	1,140	0.96	1.00
Non-Partnered	123,660	279	1.15	1.07	547	0.92	0.93	133	0.44	0.77	960	0.83	0.93
Benefit Period													
Lifetime	329,616	261	1.00	0.97	899	1.13	1.06	149	0.42	0.75	1,310	0.92	0.99
Non-Lifetime	135,691	228	1.16	1.07	459	0.97	0.96	103	0.42	0.73	790	0.85	0.94
Inflation Option													
Auto	416,899	339	1.10	1.03	1,044	1.08	1.04	166	0.39	0.71	1,549	0.91	0.98
None	48,407	150	1.01	0.98	314	1.04	0.97	86	0.48	0.79	551	0.86	0.93
Payment Type													
Indemnity	152,745	71	0.78	0.81	394	1.28	1.18	70	0.54	0.89	535	1.01	1.07
Reimbursement	312,562	418	1.14	1.06	964	1.01	0.97	183	0.38	0.69	1,565	0.86	0.94
Underwriting													
Preferred	305,777	295	1.02	0.97	801	0.99	0.96	143	0.37	0.66	1,239	0.83	0.91
Standard	136,705	155	1.08	1.03	457	1.16	1.08	88	0.48	0.82	701	0.97	1.02
Substandard	22,824	39	1.55	1.45	100	1.60	1.44	22	0.69	1.11	161	1.34	1.38
Rate Series													
200 Series	197,434	335	1.20	1.10	857	1.22	1.08	162	0.45	0.80	1,355	1.00	1.03
300+ Series	267,872	154	0.86	0.87	501	0.89	0.93	90	0.37	0.65	745	0.75	0.87
Attained Age													
<65	200,211	19	0.82	0.87	141	0.98	1.03	16	0.40	0.55	177	0.85	0.94
65 - 69	124,121	50	1.14	1.07	176	0.80	0.94	24	0.33	0.61	250	0.74	0.92
70 - 74	87,189	88	1.01	0.99	288	0.97	1.00	51	0.41	0.79	427	0.84	0.97
75 - 79	38,217	123	1.04	0.99	325	1.13	1.00	66	0.44	0.81	515	0.92	0.97
80 - 84	12,137	117	1.11	1.06	279	1.41	1.08	57	0.47	0.80	453	1.05	1.02
85+	3,431	92	1.17	1.03	149	1.24	1.07	38	0.42	0.68	279	0.93	0.95
Total	465,306	489	1.07	1.02	1,358	1.07	1.02	252	0.42	0.74	2,100	0.90	0.97

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-2a
Ultimate Voluntary Lapse Probabilities
Lifetime Payment Option for Attained Age 70 and Older and Policy Durations 9+
All Rate Series

Inflation Option	Benefit Period	Lifetime Payment		Discounted Renewal Lifetime Payment	
		Non-Partnered	Partnered	Non-Partnered	Partnered
None	Non-Lifetime	0.9%	0.5%	0.7%	0.4%
	Lifetime	0.7%	0.4%	0.5%	0.3%
Auto	Non-Lifetime	0.6%	0.4%	0.5%	0.3%
	Lifetime	0.5%	0.3%	0.4%	0.2%

Exhibit A-2b
Actual-to-Expected Voluntary Lapse Experience 2009-2018
Lifetime Payment Option^[1] for Policy Durations 9+
All Rate Series Combined

Policy or Insured Characteristic	Policy Year	Actual	Actual-to-Expected Lapse Probability		
	Exposure [A]	Lapses [B]	Unadjusted ^[2] [C]	Modeled [D]	Expected ^[3] [E]
Benefit Period and Inflation Option					
Lifetime and Auto	178,652	841	0.77	0.96	0.99
Lifetime and None	18,095	122	1.04	1.11	1.22
Non-Lifetime and Auto	66,603	364	0.88	1.01	1.07
Non-Lifetime and None	14,132	199	2.12	1.64	1.94
Attained Age					
<65	89,326	672	1.25	1.17	1.15
65 - 69	78,049	318	0.67	0.97	0.97
70 - 74	64,439	285	0.72	0.98	1.08
75 - 79	31,826	133	0.65	0.82	0.94
80 - 84	10,689	86	1.18	1.08	1.56
85+	3,152	32	1.37	1.11	1.63
Total	277,482	1,526	0.89	1.04	1.10

[1] Excludes experience for policies with Discounted Renewal Payment Option.

[2] All-lives lapse assumption from the 2018 rate increase filings.

[3] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-3a
Active Mortality Hazard Rate Adjustment Factors
All Rate Series

Attained Age ^[1]	Preferred Underwriting				Standard Underwriting				Substandard Underwriting				Duration	Policy Duration Adjustment
	Female		Male		Female		Male		Female		Male			
	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered		
<50	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1	0.94
50	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2	0.90
51	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3	0.86
52	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	4	0.83
53	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5	0.81
54	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	6	0.84
55	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	7	0.87
56	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8	0.89
57	0.97	0.98	0.97	0.97	0.98	0.99	0.98	0.98	0.99	0.99	0.98	0.99	9	0.91
58	0.95	0.96	0.94	0.95	0.97	0.98	0.96	0.97	0.97	0.98	0.97	0.98	10	0.93
59	0.93	0.94	0.92	0.94	0.95	0.96	0.94	0.96	0.96	0.97	0.95	0.97	11	0.94
60	0.90	0.92	0.90	0.92	0.92	0.95	0.92	0.95	0.94	0.96	0.94	0.96	12	0.96
61	0.86	0.89	0.86	0.89	0.89	0.92	0.89	0.92	0.90	0.94	0.91	0.94	13	0.98
62	0.85	0.89	0.85	0.89	0.87	0.91	0.88	0.92	0.89	0.94	0.90	0.94	14	1.00
63	0.82	0.87	0.83	0.88	0.85	0.91	0.86	0.91	0.88	0.93	0.88	0.94	15	1.02
64	0.81	0.87	0.81	0.87	0.84	0.90	0.85	0.91	0.87	0.93	0.87	0.94	16	1.02
65	0.80	0.86	0.80	0.87	0.83	0.90	0.84	0.91	0.86	0.93	0.87	0.94	17	1.02
66	0.81	0.88	0.82	0.89	0.85	0.92	0.87	0.93	0.88	0.95	0.90	0.97	18	1.01
67	0.83	0.88	0.85	0.90	0.87	0.93	0.89	0.95	0.91	0.97	0.93	0.99	19	1.01
68	0.86	0.90	0.89	0.94	0.89	0.94	0.93	0.98	0.93	0.98	0.97	1.02	20	1.00
69	0.88	0.92	0.93	0.97	0.92	0.96	0.97	1.01	0.95	0.99	1.00	1.05	21	1.01
70	0.92	0.95	0.98	1.02	0.95	0.99	1.02	1.06	0.98	1.01	1.05	1.08	22+	1.00
71	0.94	0.97	1.01	1.04	0.98	1.01	1.05	1.09	0.99	1.02	1.07	1.11		
72	0.96	0.99	1.04	1.07	1.00	1.04	1.08	1.12	1.01	1.05	1.09	1.13		
73	0.98	1.02	1.06	1.09	1.04	1.07	1.12	1.15	1.03	1.06	1.11	1.14		
74	1.02	1.03	1.09	1.11	1.06	1.07	1.14	1.15	1.05	1.07	1.13	1.15		
75	1.03	1.03	1.09	1.10	1.06	1.07	1.13	1.14	1.06	1.06	1.13	1.13		
76	1.04	1.04	1.09	1.09	1.07	1.06	1.12	1.12	1.07	1.06	1.12	1.12		
77	1.04	1.02	1.07	1.06	1.06	1.05	1.10	1.09	1.07	1.05	1.11	1.09		
78	1.02	1.02	1.03	1.03	1.05	1.05	1.06	1.06	1.06	1.06	1.07	1.07		
79	1.02	1.02	1.01	1.01	1.06	1.06	1.05	1.05	1.06	1.07	1.06	1.06		
80	1.02	1.03	1.01	1.02	1.07	1.08	1.05	1.07	1.07	1.09	1.06	1.07		
81	1.02	1.04	1.01	1.02	1.07	1.09	1.05	1.07	1.07	1.09	1.06	1.07		
82	1.02	1.04	1.01	1.03	1.07	1.09	1.06	1.08	1.07	1.09	1.06	1.08		
83	1.02	1.03	1.03	1.04	1.07	1.08	1.08	1.09	1.06	1.07	1.07	1.09		
84	1.02	1.03	1.04	1.05	1.06	1.06	1.08	1.09	1.05	1.06	1.08	1.09		
85	1.00	1.01	1.03	1.03	1.04	1.04	1.07	1.07	1.04	1.04	1.07	1.07		
86	1.01	1.01	1.04	1.04	1.04	1.04	1.07	1.07	1.04	1.04	1.07	1.07		
87	1.01	1.01	1.04	1.04	1.04	1.04	1.07	1.07	1.04	1.04	1.06	1.06		
88	1.02	1.02	1.04	1.04	1.05	1.05	1.06	1.06	1.05	1.05	1.06	1.06		
89	1.03	1.03	1.04	1.04	1.05	1.05	1.06	1.06	1.05	1.05	1.06	1.06		
90	1.05	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06		
91	1.05	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.05	1.05	1.06	1.06		
92	1.05	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.05	1.05	1.05	1.05		
93	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05		
94	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05		
95	1.04	1.04	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05		
96	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04		
97	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04		
98	1.03	1.03	1.03	1.03	1.03	1.03	1.04	1.04	1.03	1.03	1.03	1.03		
99	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03		
100	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.03	1.02	1.02	1.03	1.03		
101	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02		
102	1.01	1.01	1.02	1.02	1.02	1.02	1.02	1.02	1.01	1.01	1.02	1.02		
103	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
104	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
105+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		

[1] Attained age adjustments are applicable to policy durations 7+.

Exhibit A-3b
Actual-to-Expected Active Mortality Experience 2009-2018
Policy Durations 7+
All Rate Series Combined

Policy or Insured Characteristic	Policy Year Exposure [A]	Actual Deaths [B]	Actual-to-Expected Active Mortality Probability		
			Unadjusted [C]	Modeled [D]	Expected ^[1] [E]
Sex					
Female	259,872	917	0.82	0.92	0.89
Male	205,434	1,107	0.93	1.02	0.99
Partner Status					
Partnered	341,646	1,338	0.83	0.93	0.91
Non-Partnered	123,660	686	0.97	1.05	1.02
Underwriting Class					
Preferred	305,777	1,214	0.79	0.88	0.86
Standard	136,705	629	0.95	1.04	1.01
Substandard	22,824	181	1.64	1.78	1.73
Policy Duration					
7 - 9	185,581	537	0.77	0.93	0.92
10 - 14	228,952	1,057	0.88	0.97	0.94
15+	50,774	430	1.02	1.03	0.99
Attained Age					
<65	200,211	322	0.74	0.90	0.90
65 - 69	124,121	402	0.75	0.91	0.91
70 - 74	87,189	541	0.96	1.01	0.98
75 - 79	38,217	400	0.98	1.01	0.96
80 - 84	12,137	238	1.03	1.06	1.01
85+	3,431	121	0.90	0.93	0.88
Total	465,306	2,024	0.88	0.97	0.95

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-4
Actual-to-Expected Composite^[1] Termination Experience 2009-2018
Lifetime Payment Option^[2] for Policy Durations 9+
All Rate Series Combined

Attained Age	Policy Year Exposure [A]	Actual Terminations [B]	Actual-to-Expected Composite Termination Probability [C]
<65	89,326	844	1.12
65 - 69	78,049	575	0.94
70 - 74	64,439	698	1.03
75 - 79	31,826	482	0.98
80 - 84	10,689	300	1.14
85+	3,152	142	0.97
Total	277,482	3,041	1.03

[1] Combination of active mortality and voluntary lapse.

[2] Excludes experience for policies with Discounted Renewal Payment Option

Exhibit A-5
Actual-to-Expected Disabled Mortality Experience 2009-2018
Claim Months 4 to 96
All Rate Series Combined

Policy or Insured Characteristic	ALF Starting Site of Care				HHC Starting Site of Care				SNF Starting Site of Care				Total			
	Exposure [A]	Actual Deaths [B]	Actual-to-Expected (A:E)		Exposure [A]	Actual Deaths [B]	A:E		Exposure [A]	Actual Deaths [B]	A:E		Exposure [A]	Actual Deaths [B]	A:E	
			2017 Guidelines [C]	Expected ^[1] [D]			2017 Guidelines [C]	Expected ^[1] [D]			2017 Guidelines [C]	Expected ^[1] [D]			2017 Guidelines [C]	Expected ^[1] [D]
Sex																
Female	8,222	91	0.79	0.93	18,755	231	0.86	0.97	2,281	45	0.98	1.09	29,259	367	0.86	0.97
Male	4,523	72	0.74	0.88	10,859	218	0.97	1.03	1,803	45	0.88	0.98	17,185	335	0.90	0.99
Benefit Period																
Lifetime	7,405	80	0.74	0.90	21,074	290	0.89	0.98	2,683	52	0.89	1.01	31,162	422	0.86	0.97
Non-Lifetime	5,340	83	0.80	0.91	8,540	159	0.95	1.02	1,401	38	0.98	1.07	15,282	280	0.90	0.99
Partner Status																
Partnered	4,976	73	0.83	0.95	16,867	280	0.95	1.01	1,737	50	1.13	1.22	23,580	403	0.94	1.02
Non-Partnered	7,769	90	0.73	0.88	12,747	169	0.85	0.97	2,347	40	0.75	0.87	22,863	299	0.80	0.93
Payment Type																
Indemnity	2,080	27	0.81	1.08	9,529	106	0.68	0.83	1,141	22	0.80	0.97	12,751	155	0.72	0.88
Reimbursement	10,665	136	0.76	0.88	20,085	343	1.01	1.06	2,943	68	0.98	1.05	33,693	547	0.93	1.01
Claim Duration (Annual)																
1	3,446	42	0.62	0.76	7,403	133	0.75	0.88	1,322	45	0.99	1.11	12,170	220	0.76	0.89
2	3,346	45	0.93	1.09	7,584	90	0.82	0.90	1,029	22	1.11	1.23	11,960	157	0.88	0.99
3	2,376	24	0.66	0.77	5,256	90	1.26	1.28	725	6	0.45	0.49	8,358	120	0.99	1.05
4	1,605	22	0.86	0.99	3,556	53	1.10	1.12	470	8	0.95	1.04	5,630	83	1.01	1.07
5	889	15	1.00	1.17	2,340	35	1.03	1.07	261	3	0.60	0.65	3,490	53	0.98	1.05
6+	1,083	15	0.77	0.90	3,475	48	0.91	0.97	277	6	1.18	1.34	4,836	69	0.89	0.98
Incurred Age																
<65	1,026	10	0.66	0.83	5,236	74	0.87	0.99	474	7	0.69	0.81	6,736	91	0.83	0.96
65 - 69	2,349	25	0.70	0.87	4,339	69	0.96	1.08	579	9	0.62	0.72	7,267	103	0.84	0.98
70 - 74	2,542	23	0.55	0.69	5,600	91	0.99	1.09	1,021	14	0.58	0.69	9,163	128	0.81	0.93
75 - 79	3,101	40	0.81	0.97	6,671	89	0.82	0.90	998	26	1.17	1.28	10,770	155	0.86	0.97
80 - 84	2,007	30	0.88	1.02	5,312	86	0.95	1.00	723	22	1.28	1.34	8,042	138	0.97	1.04
85+	1,719	35	0.97	1.01	2,456	40	0.88	0.90	289	12	1.31	1.32	4,465	87	0.96	0.99
Total	12,745	163	0.77	0.91	29,614	449	0.91	0.99	4,084	90	0.93	1.03	46,443	702	0.87	0.98

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-6
Actual-to-Expected Disabled Recovery Experience 2009-2018
Claim Months 4 to 96
All Rate Series Combined

Policy or Insured Characteristic	ALF Starting Site of Care				HHC Starting Site of Care				SNF Starting Site of Care				Total			
	Exposure [A]	Actual Recoveries [B]	Actual-to-Expected (A:E)		Exposure [A]	Actual Recoveries [B]	A:E		Exposure [A]	Actual Recoveries [B]	A:E		Exposure [A]	Actual Recoveries [B]	A:E	
			2017 Guidelines ^[1]	Expected ^[2]			2017 Guidelines ^[1]	Expected ^[2]			2017 Guidelines ^[1]	Expected ^[2]			2017 Guidelines ^[1]	Expected ^[2]
			[C]	[D]			[C]	[D]			[C]	[D]			[C]	[D]
Sex																
Female	8,222	17	1.04	0.93	18,755	121	0.84	0.90	2,281	16	1.44	1.24	29,259	154	0.90	0.93
Male	4,523	5	0.41	0.38	10,859	57	1.01	1.06	1,803	12	1.33	1.10	17,185	74	0.95	0.95
Benefit Period																
Lifetime	7,405	9	0.61	0.52	21,074	115	0.91	0.96	2,683	15	1.23	1.01	31,162	139	0.91	0.91
Non-Lifetime	5,340	13	0.95	0.92	8,540	63	0.84	0.93	1,401	13	1.64	1.46	15,282	89	0.92	0.98
Partner Status																
Partnered	4,976	4	0.34	0.37	16,867	85	0.74	0.82	1,737	12	1.36	1.26	23,580	101	0.75	0.82
Non-Partnered	7,769	18	1.07	0.87	12,747	93	1.08	1.09	2,347	16	1.41	1.12	22,863	127	1.11	1.06
Payment Type																
Indemnity	2,080	3	0.66	0.46	9,529	75	1.21	1.09	1,141	10	1.81	1.27	12,751	88	1.22	1.06
Reimbursement	10,665	19	0.80	0.76	20,085	103	0.74	0.86	2,943	18	1.23	1.13	33,693	140	0.79	0.87
Claim Duration (Annual)																
1	3,446	6	0.69	0.53	7,403	110	1.10	1.08	1,322	13	1.39	1.08	12,170	129	1.09	1.03
2	3,346	7	1.02	0.94	7,584	34	0.68	0.74	1,029	10	2.10	1.84	11,960	51	0.83	0.86
3	2,376	3	0.58	0.59	5,256	15	0.65	0.81	725	3	1.03	1.01	8,358	21	0.67	0.79
4	1,605	1	0.26	0.29	3,556	9	0.67	0.89	470	1	0.55	0.57	5,630	11	0.57	0.71
5	889	2	1.15	1.08	2,340	4	0.59	0.76	261	0	0.00	0.00	3,490	6	0.66	0.76
6+	1,083	3	1.46	1.42	3,475	6	0.80	0.95	277	1	1.50	1.21	4,836	10	0.98	1.08
Incurred Age																
<65	1,026	0	0.00	0.00	5,236	54	1.41	1.30	474	4	1.87	1.36	6,736	58	1.37	1.23
65 - 69	2,349	2	0.39	0.32	4,339	40	1.27	1.26	579	3	1.03	0.79	7,267	45	1.14	1.08
70 - 74	2,542	4	0.68	0.56	5,600	33	0.82	0.89	1,021	9	1.82	1.36	9,163	46	0.90	0.91
75 - 79	3,101	7	1.01	0.93	6,671	28	0.62	0.70	998	4	0.79	0.72	10,770	39	0.68	0.74
80 - 84	2,007	8	1.78	1.87	5,312	15	0.46	0.58	723	5	1.34	1.41	8,042	28	0.68	0.83
85+	1,719	1	0.26	0.29	2,456	8	0.61	0.65	289	3	2.18	2.18	4,465	12	0.65	0.70
Total	12,745	22	0.77	0.70	29,614	178	0.89	0.95	4,084	28	1.39	1.18	46,443	228	0.91	0.94

[1] The 2017 *Guidelines* is included for illustrative purposes only as this expected basis was not directly used in developing the implied recovery assumption.

[2] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-7
Actual-to-Expected Composite Claim Termination Experience 2009-2018
Claim Months 4 to 96
All Rate Series Combined

Policy or Insured Characteristic	ALF Starting Site of Care				HHC Starting Site of Care				SNF Starting Site of Care				Total			
	Exposure	Terminations	Claim	Actual-to-Expected (A:E)	Exposure	Terminations	Claim	A:E	Exposure	Terminations	Claim	A:E	Exposure	Terminations	Claim	A:E
			2017 Guidelines	Expected ^[1]			2017 Guidelines	Expected ^[1]			2017 Guidelines	Expected ^[1]			2017 Guidelines	Expected ^[1]
	[A]	[B]	[C]	[D]	[A]	[B]	[C]	[D]	[A]	[B]	[C]	[D]	[A]	[B]	[C]	[D]
Sex																
Female	8,222	108	0.82	0.93	18,755	352	0.85	0.94	2,281	61	1.06	1.13	29,259	521	0.86	0.96
Male	4,523	77	0.71	0.81	10,859	275	0.97	1.03	1,803	57	0.94	1.00	17,185	409	0.90	0.98
Benefit Period																
Lifetime	7,405	89	0.72	0.84	21,074	405	0.89	0.98	2,683	67	0.94	1.01	31,162	561	0.87	0.95
Non-Lifetime	5,340	96	0.81	0.91	8,540	222	0.91	0.99	1,401	51	1.09	1.15	15,282	369	0.90	0.99
Partner Status																
Partnered	4,976	77	0.77	0.88	16,867	365	0.88	0.96	1,737	62	1.17	1.23	23,580	504	0.89	0.97
Non-Partnered	7,769	108	0.77	0.88	12,747	262	0.92	1.01	2,347	56	0.86	0.93	22,863	426	0.87	0.96
Payment Type																
Indemnity	2,080	30	0.79	0.95	9,529	181	0.83	0.92	1,141	32	0.96	1.05	12,751	243	0.84	0.94
Reimbursement	10,665	155	0.76	0.87	20,085	446	0.93	1.01	2,943	86	1.02	1.07	33,693	687	0.89	0.98
Claim Duration (Annual)																
1	3,446	48	0.63	0.72	7,403	243	0.87	0.96	1,322	58	1.05	1.11	12,170	349	0.85	0.94
2	3,346	52	0.94	1.07	7,584	124	0.78	0.85	1,029	32	1.30	1.37	11,960	208	0.87	0.95
3	2,376	27	0.65	0.74	5,256	105	1.11	1.18	725	9	0.55	0.59	8,358	141	0.92	1.00
4	1,605	23	0.78	0.89	3,556	62	1.00	1.07	470	9	0.88	0.95	5,630	94	0.92	1.01
5	889	17	1.02	1.16	2,340	39	0.96	1.02	261	3	0.53	0.56	3,490	59	0.93	1.01
6+	1,083	18	0.83	0.95	3,475	54	0.90	0.97	277	7	1.21	1.32	4,836	79	0.90	0.99
Incurred Age																
<65	1,026	10	0.58	0.68	5,236	128	1.03	1.10	474	11	0.89	0.95	6,736	149	0.97	1.05
65 - 69	2,349	27	0.66	0.78	4,339	109	1.05	1.14	579	12	0.69	0.74	7,267	148	0.91	1.01
70 - 74	2,542	27	0.56	0.67	5,600	124	0.93	1.03	1,021	23	0.79	0.86	9,163	174	0.83	0.92
75 - 79	3,101	47	0.83	0.97	6,671	117	0.76	0.84	998	30	1.10	1.16	10,770	194	0.82	0.91
80 - 84	2,007	38	0.98	1.13	5,312	101	0.81	0.90	723	27	1.29	1.35	8,042	166	0.90	1.00
85+	1,719	36	0.90	0.94	2,456	48	0.81	0.85	289	15	1.42	1.44	4,465	99	0.90	0.94
Total	12,745	185	0.77	0.88	29,614	627	0.90	0.98	4,084	118	1.00	1.06	46,443	930	0.88	0.97

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-8a
Claim Duration Utilization Adjustment Factors
All Rate Series
Reimbursement Payment Type
ALF Starting Site of Care

Claim Duration Month	Non-Lifetime Benefit Period						Lifetime Benefit Period					
	No Inflation			Auto Inflation			No Inflation			Auto Inflation		
	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+
1	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
2	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
3	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
4	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
5	0.88	0.88	0.96	0.86	0.87	0.95	0.82	0.82	0.89	0.80	0.81	0.88
6	0.88	0.88	0.97	0.87	0.88	0.96	0.81	0.82	0.89	0.80	0.81	0.89
7	0.90	0.91	0.97	0.90	0.92	0.98	0.84	0.86	0.91	0.85	0.87	0.92
8	0.91	0.92	0.97	0.94	0.94	0.99	0.88	0.89	0.93	0.90	0.91	0.95
9	0.94	0.94	0.98	0.97	0.97	1.00	0.92	0.92	0.96	0.94	0.95	0.98
10	0.97	0.96	0.99	1.00	0.99	1.02	0.96	0.95	0.98	0.99	0.99	1.02
11	0.97	0.96	0.98	1.00	0.99	1.01	0.98	0.97	0.99	1.02	1.00	1.03
12	0.98	0.95	0.98	1.00	0.98	1.01	1.00	0.97	1.00	1.03	1.00	1.03
13	0.98	0.96	0.99	1.01	0.99	1.02	1.01	0.99	1.02	1.04	1.01	1.05
14	0.99	0.98	1.01	1.02	1.01	1.04	1.02	1.00	1.03	1.05	1.03	1.06
15	1.00	0.99	1.02	1.03	1.02	1.05	1.02	1.01	1.04	1.05	1.05	1.08
16	1.00	1.00	1.03	1.04	1.04	1.06	1.02	1.02	1.05	1.06	1.06	1.09
17	1.01	1.02	1.04	1.05	1.05	1.08	1.02	1.02	1.05	1.06	1.06	1.09
18	1.02	1.02	1.04	1.05	1.06	1.08	1.02	1.02	1.05	1.06	1.06	1.08
19	1.02	1.02	1.04	1.06	1.05	1.08	1.02	1.02	1.04	1.06	1.06	1.08
20	1.02	1.01	1.04	1.05	1.05	1.07	1.02	1.02	1.04	1.05	1.05	1.08
21	1.02	1.01	1.03	1.05	1.04	1.07	1.03	1.02	1.05	1.06	1.05	1.08
22	1.01	1.00	1.03	1.05	1.04	1.06	1.04	1.03	1.05	1.07	1.06	1.09
23	1.01	1.00	1.02	1.04	1.03	1.05	1.05	1.03	1.05	1.08	1.07	1.09
24	1.00	0.99	1.01	1.04	1.02	1.04	1.05	1.03	1.05	1.09	1.07	1.09
25	1.00	0.98	1.00	1.04	1.02	1.04	1.05	1.03	1.05	1.10	1.08	1.10
26	1.00	0.98	1.00	1.05	1.03	1.04	1.06	1.04	1.05	1.11	1.08	1.10
27	1.01	0.98	1.00	1.06	1.04	1.05	1.06	1.03	1.05	1.11	1.09	1.10
28	1.01	0.99	1.00	1.07	1.04	1.05	1.06	1.03	1.05	1.11	1.09	1.10
29	1.02	0.99	1.00	1.08	1.05	1.06	1.06	1.03	1.05	1.13	1.09	1.11
30	1.03	1.00	1.01	1.09	1.06	1.07	1.07	1.04	1.05	1.13	1.10	1.11
31	1.03	1.00	1.01	1.10	1.06	1.07	1.07	1.03	1.05	1.14	1.10	1.11
32	1.03	1.00	1.01	1.10	1.06	1.07	1.07	1.03	1.04	1.13	1.10	1.11
33	1.03	0.99	1.01	1.10	1.06	1.07	1.07	1.03	1.04	1.14	1.10	1.11
34	1.03	0.99	1.00	1.10	1.05	1.07	1.07	1.03	1.04	1.14	1.09	1.11
35	1.03	0.98	1.00	1.09	1.04	1.06	1.07	1.02	1.03	1.13	1.08	1.10
36	1.03	0.98	0.99	1.09	1.04	1.05	1.07	1.01	1.03	1.13	1.08	1.09
37	1.02	0.97	0.98	1.09	1.03	1.04	1.07	1.01	1.02	1.13	1.08	1.08
38	1.02	0.96	0.96	1.09	1.03	1.03	1.07	1.01	1.01	1.14	1.08	1.08
39	1.01	0.96	0.95	1.09	1.03	1.02	1.06	1.00	0.99	1.14	1.08	1.07
40	1.01	0.95	0.94	1.09	1.03	1.01	1.06	1.00	0.98	1.14	1.08	1.06
41	1.00	0.95	0.93	1.08	1.03	1.01	1.05	1.00	0.97	1.14	1.08	1.06
42	1.00	0.95	0.92	1.08	1.03	1.00	1.04	1.00	0.97	1.13	1.08	1.05
43	1.00	0.96	0.93	1.08	1.03	1.00	1.04	1.00	0.97	1.13	1.08	1.05
44	1.00	0.96	0.94	1.08	1.03	1.01	1.04	1.00	0.97	1.12	1.07	1.05
45	1.01	0.97	0.95	1.08	1.04	1.01	1.04	1.00	0.98	1.11	1.07	1.05
46	1.01	0.97	0.96	1.07	1.04	1.02	1.04	1.00	0.98	1.10	1.07	1.05
47	1.02	0.98	0.97	1.07	1.04	1.02	1.04	1.00	0.99	1.10	1.06	1.05
48	1.01	0.98	0.97	1.07	1.03	1.02	1.04	1.01	1.00	1.09	1.06	1.05
49	1.01	0.98	0.97	1.05	1.03	1.01	1.04	1.01	1.00	1.09	1.06	1.04
50	1.01	0.99	0.97	1.05	1.03	1.01	1.04	1.02	1.01	1.09	1.06	1.05
51	1.01	0.99	0.97	1.04	1.02	1.01	1.05	1.03	1.01	1.08	1.06	1.05
52	1.01	0.99	0.98	1.04	1.02	1.00	1.05	1.04	1.02	1.08	1.07	1.05
53	1.01	1.00	0.98	1.03	1.02	1.00	1.06	1.04	1.03	1.08	1.07	1.05
54	1.02	1.00	0.99	1.04	1.02	1.01	1.06	1.05	1.03	1.09	1.07	1.05
55	1.03	1.01	1.00	1.05	1.03	1.02	1.07	1.05	1.04	1.09	1.07	1.06
56	1.03	1.01	1.01	1.04	1.03	1.02	1.06	1.05	1.04	1.08	1.06	1.05
57	1.03	1.02	1.01	1.04	1.03	1.02	1.06	1.04	1.04	1.07	1.05	1.05
58	1.03	1.02	1.02	1.04	1.03	1.02	1.05	1.04	1.04	1.05	1.05	1.04
59	1.03	1.02	1.02	1.03	1.03	1.02	1.04	1.04	1.04	1.04	1.04	1.04
60	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.04	1.03	1.04	1.04	1.03
61	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.04	1.03	1.03	1.04	1.03
62	1.01	1.02	1.01	1.02	1.02	1.02	1.03	1.04	1.03	1.03	1.04	1.03
63	1.01	1.02	1.01	1.02	1.03	1.01	1.03	1.04	1.03	1.04	1.05	1.04
64	1.00	1.02	1.00	1.02	1.03	1.01	1.03	1.05	1.03	1.04	1.06	1.04
65	1.00	1.02	1.00	1.01	1.03	1.01	1.03	1.05	1.03	1.05	1.06	1.04
66	1.00	1.02	0.99	1.01	1.03	1.01	1.03	1.05	1.03	1.05	1.07	1.04
67	0.99	1.01	0.99	1.01	1.03	1.01	1.03	1.05	1.03	1.05	1.07	1.04
68	0.99	1.01	0.99	1.01	1.03	1.00	1.03	1.05	1.02	1.04	1.06	1.04
69	0.99	1.01	0.98	1.00	1.02	1.00	1.02	1.04	1.02	1.04	1.06	1.03
70	0.99	1.00	0.98	1.00	1.01	0.99	1.02	1.03	1.01	1.03	1.05	1.03
71	0.99	1.00	0.98	1.00	1.01	0.99	1.02	1.03	1.01	1.03	1.04	1.02
72	0.99	0.99	0.98	1.00	1.00	0.99	1.01	1.02	1.01	1.02	1.03	1.02
73	0.99	0.99	0.98	0.99	1.00	0.99	1.01	1.01	1.00	1.02	1.02	1.01
74	0.98	0.99	0.98	0.99	0.99	0.98	1.01	1.01	1.00	1.02	1.02	1.01
75	0.98	0.98	0.97	0.99	0.99	0.98	1.00	1.00	0.99	1.01	1.01	1.00
76	0.98	0.98	0.97	0.99	0.99	0.98	1.00	1.00	0.99	1.01	1.01	1.00
77	0.97	0.97	0.96	0.98	0.99	0.97	1.00	1.00	0.99	1.01	1.01	1.00
78	0.96	0.97	0.95	0.98	0.99	0.97	0.99	1.00	0.99	1.01	1.02	1.00
79	0.96	0.97	0.95	0.97	0.98	0.97	1.00	1.00	0.99	1.01	1.02	1.00
80	0.96	0.96	0.95	0.97	0.98	0.96	1.00	1.01	0.99	1.02	1.02	1.01
81	0.96	0.96	0.94	0.97	0.98	0.96	1.00	1.01	0.99	1.02	1.03	1.01
82	0.96	0.96	0.94	0.98	0.98	0.96	1.00	1.01	0.99	1.02	1.03	1.01
83	0.96	0.96	0.94	0.98	0.98	0.96	1.01	1.01	0.99	1.03	1.03	1.01
84	0.97	0.97	0.95	0.99	0.99	0.97	1.01	1.01	0.99	1.03	1.03	1.01
85	0.97	0.97	0.95	0.99	0.99	0.97	1.01	1.01	0.99	1.04	1.04	1.01
86	0.97	0.97	0.95	1.00	1.00	0.98	1.01	1.01	0.99	1.04	1.04	1.02
87	0.98	0.98	0.95	1.00	1.00	0.98	1.02	1.01	0.99	1.04	1.04	1.02
88	0.98	0.98	0.96	1.01	1.01	0.98	1.02	1.01	0.99	1.05	1.04	1.02
89	0.98	0.98	0.96	1.01	1.01	0.99	1.02	1.01	0.99	1.05	1.04	1.02
90	0.98	0.98	0.96	1.01	1.01	0.99	1.02	1.01	0.99	1.05	1.04	1.02
91	0.98	0.98	0.96	1.01	1.01	0.99	1.02	1.01	0.99	1.05	1.04	1.02
92	0.99	0.98	0.96	1.01	1.01	0.99	1.01	1.01	0.99	1.04	1.04	1.02
93	0.99	0.99	0.97	1.01	1.01	0.99	1.01	1.01	0.99	1.03	1.03	1.01
94	0.99	0.99	0.98	1.01	1.00	0.99	1.01	1.00	0.99	1.02	1.02	1.01
95	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01
96+	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.00

Exhibit A-8a
Claim Duration Utilization Adjustment Factors
All Rate Series
Reimbursement Payment Type
HHC Starting Site of Care

Claim Duration Month	Non-Lifetime Benefit Period						Lifetime Benefit Period					
	No Inflation			Auto Inflation			No Inflation			Auto Inflation		
	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+
1	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
2	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
3	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
4	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
5	0.90	0.87	1.01	0.84	0.81	0.95	0.88	0.85	1.00	0.83	0.80	0.93
6	0.89	0.85	1.02	0.82	0.79	0.94	0.87	0.84	1.00	0.80	0.77	0.92
7	0.90	0.88	1.04	0.83	0.81	0.96	0.89	0.86	1.02	0.82	0.79	0.94
8	0.92	0.91	1.07	0.85	0.84	0.98	0.91	0.90	1.05	0.84	0.82	0.96
9	0.95	0.95	1.09	0.88	0.88	1.01	0.93	0.94	1.07	0.86	0.87	1.00
10	0.97	1.00	1.11	0.91	0.93	1.04	0.96	0.99	1.10	0.90	0.92	1.03
11	1.00	1.05	1.14	0.95	0.99	1.08	1.00	1.04	1.14	0.95	0.99	1.08
12	1.03	1.09	1.17	0.99	1.04	1.12	1.04	1.09	1.18	0.99	1.05	1.13
13	1.05	1.11	1.20	1.01	1.07	1.16	1.06	1.12	1.21	1.02	1.08	1.17
14	1.06	1.12	1.21	1.03	1.09	1.18	1.08	1.14	1.23	1.05	1.11	1.20
15	1.08	1.13	1.23	1.05	1.10	1.20	1.10	1.15	1.25	1.07	1.12	1.22
16	1.10	1.14	1.25	1.07	1.11	1.22	1.12	1.16	1.28	1.10	1.14	1.25
17	1.11	1.15	1.26	1.09	1.13	1.24	1.14	1.17	1.29	1.12	1.16	1.27
18	1.13	1.15	1.28	1.12	1.14	1.26	1.16	1.18	1.31	1.14	1.16	1.29
19	1.16	1.17	1.29	1.15	1.15	1.28	1.19	1.19	1.32	1.17	1.18	1.30
20	1.18	1.18	1.31	1.18	1.17	1.30	1.21	1.21	1.33	1.20	1.20	1.32
21	1.21	1.20	1.32	1.21	1.20	1.32	1.24	1.23	1.35	1.24	1.23	1.35
22	1.23	1.22	1.33	1.25	1.23	1.35	1.26	1.24	1.36	1.27	1.26	1.37
23	1.25	1.23	1.34	1.27	1.25	1.36	1.28	1.25	1.36	1.30	1.27	1.39
24	1.26	1.23	1.34	1.28	1.26	1.37	1.29	1.26	1.37	1.31	1.28	1.40
25	1.26	1.23	1.34	1.29	1.26	1.37	1.29	1.27	1.38	1.32	1.30	1.41
26	1.25	1.23	1.33	1.29	1.26	1.37	1.30	1.27	1.38	1.33	1.31	1.42
27	1.25	1.23	1.33	1.29	1.27	1.37	1.30	1.28	1.39	1.34	1.32	1.43
28	1.23	1.22	1.32	1.27	1.26	1.36	1.31	1.30	1.39	1.35	1.34	1.44
29	1.23	1.23	1.31	1.27	1.28	1.35	1.31	1.32	1.40	1.36	1.37	1.45
30	1.22	1.24	1.30	1.27	1.29	1.35	1.32	1.34	1.41	1.37	1.40	1.46
31	1.21	1.24	1.29	1.26	1.30	1.35	1.32	1.36	1.41	1.38	1.41	1.47
32	1.21	1.25	1.29	1.26	1.30	1.34	1.32	1.36	1.41	1.38	1.43	1.47
33	1.21	1.25	1.28	1.26	1.30	1.33	1.32	1.37	1.40	1.38	1.43	1.46
34	1.21	1.25	1.27	1.26	1.30	1.33	1.33	1.37	1.39	1.38	1.43	1.45
35	1.22	1.25	1.26	1.27	1.30	1.32	1.34	1.37	1.39	1.39	1.43	1.45
36	1.22	1.25	1.26	1.27	1.30	1.31	1.35	1.38	1.39	1.40	1.43	1.44
37	1.23	1.26	1.25	1.28	1.30	1.30	1.37	1.39	1.39	1.41	1.44	1.44
38	1.25	1.27	1.26	1.28	1.31	1.29	1.38	1.40	1.39	1.42	1.45	1.43
39	1.25	1.28	1.26	1.29	1.32	1.29	1.38	1.41	1.38	1.41	1.45	1.42
40	1.26	1.30	1.26	1.29	1.32	1.28	1.38	1.42	1.38	1.41	1.45	1.41
41	1.25	1.30	1.25	1.28	1.32	1.28	1.37	1.42	1.37	1.40	1.45	1.40
42	1.24	1.29	1.24	1.27	1.32	1.27	1.36	1.41	1.36	1.39	1.45	1.39
43	1.23	1.28	1.23	1.26	1.31	1.26	1.35	1.40	1.35	1.38	1.44	1.38
44	1.22	1.27	1.21	1.26	1.31	1.25	1.35	1.40	1.34	1.39	1.45	1.38
45	1.21	1.26	1.19	1.26	1.31	1.24	1.35	1.41	1.34	1.41	1.47	1.39
46	1.20	1.25	1.17	1.26	1.31	1.23	1.36	1.41	1.33	1.43	1.48	1.39
47	1.20	1.24	1.16	1.27	1.31	1.23	1.37	1.42	1.32	1.44	1.50	1.40
48	1.21	1.24	1.15	1.28	1.32	1.22	1.38	1.42	1.31	1.47	1.51	1.40
49	1.21	1.24	1.14	1.29	1.33	1.22	1.38	1.42	1.30	1.48	1.52	1.39
50	1.20	1.23	1.12	1.29	1.32	1.20	1.37	1.41	1.28	1.48	1.51	1.38
51	1.19	1.21	1.11	1.28	1.30	1.19	1.36	1.39	1.27	1.47	1.49	1.36
52	1.18	1.20	1.10	1.26	1.28	1.18	1.35	1.37	1.26	1.45	1.47	1.35
53	1.16	1.18	1.08	1.24	1.26	1.16	1.34	1.36	1.25	1.43	1.45	1.33
54	1.14	1.16	1.07	1.20	1.22	1.13	1.32	1.35	1.25	1.40	1.42	1.32
55	1.12	1.15	1.07	1.17	1.20	1.11	1.31	1.34	1.25	1.37	1.40	1.30
56	1.11	1.15	1.07	1.15	1.18	1.10	1.31	1.35	1.25	1.35	1.39	1.30
57	1.10	1.15	1.06	1.13	1.18	1.10	1.30	1.35	1.26	1.34	1.39	1.29
58	1.10	1.15	1.06	1.13	1.18	1.09	1.30	1.36	1.26	1.33	1.40	1.30
59	1.09	1.15	1.06	1.12	1.18	1.09	1.30	1.37	1.26	1.33	1.41	1.30
60	1.09	1.15	1.06	1.12	1.18	1.09	1.29	1.37	1.26	1.34	1.41	1.30
61	1.08	1.14	1.06	1.12	1.19	1.10	1.28	1.36	1.26	1.34	1.41	1.31
62	1.07	1.13	1.05	1.12	1.18	1.10	1.27	1.34	1.25	1.34	1.41	1.31
63	1.06	1.11	1.04	1.12	1.17	1.10	1.26	1.32	1.24	1.33	1.40	1.31
64	1.05	1.10	1.04	1.12	1.16	1.10	1.25	1.30	1.23	1.33	1.38	1.30
65	1.05	1.09	1.03	1.11	1.16	1.10	1.23	1.28	1.22	1.31	1.36	1.30
66	1.04	1.08	1.03	1.11	1.15	1.10	1.22	1.27	1.21	1.30	1.35	1.29
67	1.04	1.07	1.03	1.10	1.14	1.10	1.21	1.25	1.21	1.29	1.33	1.29
68	1.04	1.07	1.03	1.10	1.13	1.10	1.21	1.24	1.21	1.28	1.32	1.28
69	1.03	1.06	1.03	1.09	1.12	1.09	1.20	1.24	1.20	1.28	1.31	1.28
70	1.03	1.05	1.03	1.09	1.11	1.09	1.20	1.23	1.20	1.27	1.30	1.27
71	1.03	1.05	1.03	1.09	1.10	1.08	1.22	1.24	1.21	1.28	1.30	1.28
72	1.03	1.04	1.02	1.08	1.09	1.07	1.22	1.23	1.21	1.28	1.30	1.27
73	1.02	1.03	1.01	1.07	1.08	1.06	1.22	1.23	1.21	1.27	1.29	1.26
74	1.02	1.03	1.01	1.06	1.07	1.05	1.21	1.23	1.20	1.26	1.27	1.25
75	1.02	1.03	1.01	1.05	1.06	1.04	1.21	1.23	1.20	1.25	1.27	1.24
76	1.01	1.03	1.01	1.04	1.06	1.03	1.20	1.22	1.19	1.24	1.25	1.23
77	1.01	1.03	1.00	1.03	1.05	1.02	1.19	1.21	1.18	1.21	1.24	1.21
78	1.00	1.02	1.00	1.02	1.04	1.02	1.18	1.21	1.18	1.20	1.23	1.20
79	1.00	1.02	1.00	1.02	1.04	1.01	1.18	1.20	1.17	1.20	1.22	1.19
80	1.01	1.02	0.99	1.03	1.04	1.01	1.19	1.20	1.17	1.21	1.22	1.20
81	1.01	1.01	0.99	1.04	1.04	1.02	1.20	1.19	1.17	1.22	1.22	1.20
82	1.02	1.01	1.00	1.05	1.04	1.02	1.21	1.19	1.17	1.24	1.22	1.20
83	1.03	1.01	1.00	1.06	1.04	1.02	1.22	1.19	1.18	1.25	1.22	1.21
84	1.05	1.01	1.00	1.07	1.04	1.03	1.23	1.19	1.18	1.26	1.22	1.21
85	1.06	1.02	1.01	1.09	1.04	1.03	1.25	1.19	1.18	1.27	1.21	1.21
86	1.08	1.02	1.01	1.09	1.04	1.03	1.25	1.18	1.18	1.27	1.20	1.20
87	1.08	1.02	1.02	1.10	1.03	1.03	1.25	1.18	1.18	1.27	1.19	1.19
88	1.09	1.02	1.02	1.10	1.03	1.03	1.25	1.17	1.17	1.27	1.18	1.19
89	1.09	1.01	1.02	1.10	1.03	1.03	1.25	1.16	1.17	1.27	1.18	1.18
90	1.09	1.01	1.02	1.10	1.03	1.03	1.25	1.16	1.17	1.26	1.17	1.18
91	1.09	1.01	1.02	1.10	1.02	1.03	1.25	1.16	1.17	1.26	1.17	1.18
92	1.07	1.01	1.02	1.08	1.02	1.03	1.20	1.13	1.14	1.21	1.14	1.15
93	1.06	1.01	1.01	1.07	1.02	1.02	1.16	1.11	1.11	1.17	1.12	1.12
94	1.04	1.01	1.01	1.05	1.01	1.02	1.12	1.08	1.08	1.13	1.09	1.09
95	1.03	1.01	1.01	1.03	1.01	1.01	1.08	1.05	1.06	1.08	1.06	1.06
96+	1.02	1.00	1.00	1.02	1.00	1.01	1.04	1.03	1.03	1.04	1.03	1.03

Exhibit A-8a
Claim Duration Utilization Adjustment Factors
All Rate Series
Reimbursement Payment Type
SNF Starting Site of Care

Claim Duration Month	Non-Lifetime Benefit Period						Lifetime Benefit Period					
	No Inflation			Auto Inflation			No Inflation			Auto Inflation		
	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+
1	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
2	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
3	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
4	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
5	0.88	0.89	0.90	0.84	0.85	0.86	0.88	0.89	0.91	0.85	0.86	0.87
6	0.86	0.88	0.89	0.83	0.85	0.85	0.87	0.89	0.90	0.84	0.85	0.86
7	0.88	0.90	0.90	0.85	0.87	0.87	0.89	0.91	0.91	0.86	0.88	0.88
8	0.89	0.92	0.92	0.87	0.90	0.89	0.90	0.94	0.93	0.88	0.91	0.91
9	0.91	0.95	0.93	0.89	0.93	0.91	0.92	0.96	0.95	0.90	0.94	0.93
10	0.92	0.97	0.95	0.91	0.95	0.94	0.94	0.98	0.97	0.92	0.96	0.95
11	0.93	0.98	0.96	0.91	0.96	0.95	0.94	0.99	0.97	0.92	0.97	0.95
12	0.93	0.99	0.97	0.91	0.96	0.95	0.93	0.98	0.97	0.91	0.96	0.95
13	0.94	0.99	0.98	0.92	0.97	0.95	0.93	0.98	0.97	0.91	0.96	0.94
14	0.95	1.00	0.99	0.92	0.98	0.96	0.93	0.98	0.97	0.90	0.96	0.94
15	0.95	1.01	0.99	0.93	0.98	0.97	0.92	0.98	0.97	0.90	0.96	0.94
16	0.96	1.02	1.00	0.94	0.99	0.98	0.92	0.98	0.97	0.91	0.96	0.95
17	0.96	1.02	1.00	0.94	1.00	0.98	0.93	0.98	0.97	0.91	0.96	0.95
18	0.96	1.01	1.00	0.95	1.00	0.99	0.93	0.98	0.97	0.92	0.97	0.96
19	0.95	1.00	0.99	0.95	1.00	0.99	0.93	0.97	0.96	0.92	0.97	0.96
20	0.95	1.00	0.99	0.94	0.99	0.98	0.92	0.97	0.96	0.92	0.97	0.96
21	0.95	0.99	0.99	0.94	0.99	0.98	0.92	0.97	0.96	0.92	0.97	0.96
22	0.94	0.99	0.98	0.94	0.99	0.98	0.92	0.96	0.96	0.92	0.96	0.96
23	0.94	0.98	0.98	0.94	0.98	0.98	0.92	0.96	0.96	0.92	0.96	0.95
24	0.95	0.99	0.98	0.94	0.98	0.98	0.92	0.96	0.96	0.92	0.96	0.95
25	0.95	0.99	0.99	0.95	0.98	0.98	0.93	0.97	0.96	0.92	0.96	0.96
26	0.96	0.99	0.99	0.95	0.98	0.98	0.94	0.97	0.97	0.93	0.96	0.96
27	0.97	1.00	1.00	0.95	0.98	0.98	0.95	0.97	0.97	0.93	0.96	0.96
28	0.98	1.01	1.00	0.96	0.99	0.98	0.95	0.98	0.98	0.94	0.96	0.96
29	0.98	1.01	1.00	0.96	0.99	0.99	0.95	0.98	0.98	0.94	0.97	0.96
30	0.98	1.01	1.01	0.96	1.00	0.99	0.95	0.98	0.97	0.93	0.97	0.96
31	0.98	1.02	1.01	0.96	1.00	0.99	0.95	0.98	0.97	0.93	0.97	0.96
32	0.98	1.02	1.01	0.96	1.00	0.99	0.94	0.98	0.97	0.93	0.97	0.96
33	0.97	1.02	1.01	0.96	1.00	0.99	0.94	0.98	0.97	0.92	0.97	0.95
34	0.97	1.02	1.00	0.95	1.00	0.99	0.94	0.98	0.97	0.92	0.96	0.95
35	0.97	1.01	1.00	0.95	1.00	0.98	0.94	0.98	0.97	0.92	0.96	0.95
36	0.96	1.01	0.99	0.94	0.99	0.97	0.93	0.98	0.97	0.92	0.96	0.95
37	0.96	1.00	0.99	0.93	0.98	0.96	0.93	0.98	0.96	0.91	0.95	0.94
38	0.95	1.00	0.98	0.92	0.97	0.95	0.93	0.98	0.96	0.91	0.95	0.94
39	0.94	0.99	0.97	0.92	0.96	0.95	0.93	0.98	0.96	0.91	0.95	0.94
40	0.94	0.99	0.97	0.91	0.96	0.94	0.93	0.98	0.96	0.91	0.95	0.93
41	0.94	0.99	0.97	0.91	0.96	0.94	0.94	0.98	0.96	0.91	0.95	0.93
42	0.95	0.99	0.97	0.92	0.96	0.95	0.94	0.98	0.97	0.91	0.95	0.94
43	0.96	0.99	0.98	0.93	0.97	0.96	0.95	0.98	0.97	0.92	0.96	0.95
44	0.96	1.00	0.99	0.94	0.97	0.97	0.95	0.99	0.98	0.93	0.96	0.95
45	0.97	1.00	1.00	0.95	0.98	0.97	0.96	0.99	0.98	0.94	0.97	0.96
46	0.98	1.01	1.00	0.96	0.99	0.98	0.97	0.99	0.98	0.95	0.97	0.97
47	0.99	1.01	1.01	0.97	0.99	0.99	0.97	0.99	0.99	0.95	0.97	0.97
48	0.99	1.01	1.01	0.98	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
49	0.99	1.01	1.01	0.98	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
50	0.99	1.00	1.01	0.97	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
51	0.99	1.00	1.00	0.97	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
52	0.99	1.00	1.00	0.97	0.99	0.99	0.98	0.99	0.99	0.96	0.97	0.98
53	0.99	1.00	1.00	0.97	0.98	0.99	0.97	0.99	0.99	0.96	0.97	0.97
54	0.98	1.00	1.00	0.97	0.98	0.99	0.97	0.98	0.99	0.96	0.97	0.97
55	0.99	1.00	1.00	0.97	0.98	0.99	0.97	0.98	0.99	0.96	0.97	0.97
56	0.99	1.00	1.00	0.97	0.98	0.99	0.97	0.98	0.99	0.96	0.97	0.97
57	0.99	1.00	1.00	0.97	0.98	0.99	0.98	0.98	0.99	0.96	0.97	0.97
58	0.99	1.00	1.00	0.98	0.99	0.99	0.98	0.99	0.99	0.97	0.97	0.98
59	0.99	1.00	1.00	0.98	0.99	0.99	0.98	0.99	0.99	0.97	0.98	0.98
60	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00	0.98	0.99	0.99
61	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00	0.98	0.99	0.99
62	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00	0.98	1.00	0.99
63	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.01	1.01	0.99	1.00	1.00
64	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.01	0.99	1.00	1.00
65	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.01	0.99	1.01	1.00
66	0.99	1.00	1.00	0.99	1.00	0.99	1.00	1.01	1.01	0.99	1.01	1.00
67	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.00	0.99	1.00	1.00
68	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.00	0.99	1.00	1.00
69	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.01	1.00	0.99	1.00	1.00
70	0.99	1.00	0.99	0.98	0.99	0.99	0.99	1.01	1.00	0.99	1.00	0.99
71	0.98	1.00	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.98	1.00	0.99
72	0.98	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.98	1.00	0.99
73	0.98	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.99	1.00	0.99
74	0.98	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.99	1.00	1.00
75	0.99	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.99	1.00	1.00
76	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.00	1.00	0.99	1.00	1.00
77	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
78	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
79	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
91	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	0.99	0.99
92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
96+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exhibit A-8b
Actual-to-Expected Claim Duration Utilization Experience January 1, 2015-September 30, 2019
Reimbursement Payment Type with Claim Months 4 to 96
All Rate Series Combined

Policy or Insured Characteristic	ALF Starting Site of Care			HHC Starting Site of Care			SNF Starting Site of Care			Total		
	Paid	Actual-to-Expected (A:E)		Paid	A:E		Paid	A:E		Paid	A:E	
	Claims [A]	Policy Duration [B]	Expected ^[1] [C]	Claims [A]	Policy Duration [B]	Expected ^[1] [C]	Claims [A]	Policy Duration [B]	Expected ^[1] [C]	Claims [A]	Policy Duration [B]	Expected ^[1] [C]
Inflation Option												
Auto	33,114,855	1.04	1.00	43,673,599	1.23	1.01	7,177,014	0.86	0.92	83,965,467	1.11	0.99
None	6,877,349	0.94	0.95	11,484,533	1.34	1.08	2,901,278	0.93	0.96	21,263,161	1.12	1.02
Benefit Period												
Lifetime	24,909,371	1.04	1.00	38,534,998	1.31	1.04	6,800,301	0.87	0.92	70,244,670	1.15	1.01
Non-Lifetime	15,082,834	0.98	0.97	16,623,134	1.12	0.98	3,277,990	0.90	0.95	34,983,958	1.03	0.97
Incurral Age												
<75	18,875,970	1.05	1.00	22,061,201	1.22	0.99	3,252,523	0.77	0.83	44,189,693	1.10	0.98
75-84	16,838,435	0.99	0.98	26,935,259	1.23	1.01	5,692,446	0.95	1.00	49,466,140	1.10	1.00
85+	4,277,799	0.99	0.99	6,161,672	1.49	1.21	1,133,323	0.91	0.95	11,572,795	1.19	1.09
Claim Duration (Annual)												
1	9,451,948	0.88	0.96	9,355,082	0.88	0.98	2,890,881	0.82	0.91	21,697,911	0.87	0.96
2	10,879,620	1.05	1.01	13,999,327	1.20	1.02	2,554,593	0.91	0.95	27,433,540	1.11	1.01
3	7,618,306	1.09	1.01	11,415,469	1.41	1.06	2,074,441	0.92	0.96	21,108,216	1.22	1.03
4	5,425,831	1.09	1.02	8,138,340	1.51	1.09	1,333,358	0.87	0.92	14,897,529	1.26	1.05
5	3,210,531	1.07	1.00	5,046,337	1.51	1.06	787,707	0.92	0.93	9,044,575	1.26	1.03
6+	3,405,969	1.03	0.92	7,203,576	1.38	0.91	437,312	0.92	0.87	11,046,857	1.23	0.91
Total	39,992,204	1.02	0.99	55,158,132	1.25	1.02	10,078,292	0.88	0.93	105,228,628	1.11	1.00

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-9a
Day Utilization Adjustment Factors
All Rate Series
Indemnity Payment Type

Attained Age	Starting Site of Care		
	ALF	HHC	SNF
<70	0.96	0.80	0.89
70	0.96	0.80	0.89
71	0.96	0.80	0.89
72	0.96	0.80	0.89
73	0.96	0.80	0.89
74	0.96	0.80	0.89
75	0.96	0.80	0.89
76	0.96	0.81	0.89
77	0.96	0.81	0.89
78	0.96	0.81	0.91
79	0.96	0.81	0.92
80	0.96	0.81	0.92
81	0.96	0.81	0.93
82	0.96	0.81	0.93
83	0.96	0.82	0.93
84	0.96	0.83	0.93
85	0.96	0.84	0.93
86	0.96	0.86	0.93
87	0.96	0.88	0.93
88	0.96	0.90	0.93
89	0.96	0.91	0.93
90	0.96	0.91	0.93
91	0.96	0.91	0.93
92	0.96	0.92	0.94
93	0.96	0.93	0.95
94	0.96	0.94	0.96
95	0.96	0.96	0.97
96	0.96	0.97	0.98
97	0.96	0.97	0.98
98	0.96	0.97	0.99
99	0.96	0.97	0.99
100	0.97	0.97	0.99
101	0.98	0.97	0.99
102	0.98	0.97	0.99
103	0.98	0.97	0.99
104	0.98	0.97	0.99
105+	0.98	0.97	0.99

Exhibit A-9b
Actual-to-Expected Claim Duration Utilization Experience January 1, 2015-September 30, 2019
Indemnity Payment Type^[1] with Claim Months 4 to 96
All Rate Series Combined

Attained Age	ALF Starting Site of Care			HHC Starting Site of Care			SNF Starting Site of Care			Total		
	Days Paid [A]	Actual-to-Expected (A:E)		Days Paid [A]	A:E		Days Paid [A]	A:E		Days Paid [A]	A:E	
		Unadjusted ^[2] [B]	Expected ^[3] [C]		Unadjusted ^[2] [B]	Expected ^[3] [C]		Unadjusted ^[2] [B]	Expected ^[3] [C]		Unadjusted ^[2] [B]	Expected ^[3] [C]
<65	2,930	0.85	0.89	22,663	0.91	1.11	1,610	0.88	0.99	27,203	0.90	1.07
65-69	5,640	0.94	0.97	20,034	0.71	0.86	2,613	0.67	0.75	28,286	0.74	0.87
70-74	13,484	1.01	1.05	37,587	0.87	1.07	3,234	0.69	0.76	54,305	0.89	1.04
75-79	14,505	0.97	1.00	38,297	0.90	1.08	4,733	0.77	0.84	57,534	0.90	1.03
80-84	9,145	0.95	0.98	28,267	0.87	1.04	2,392	0.75	0.80	39,804	0.88	1.01
85+	3,522	0.84	0.86	25,240	0.96	1.05	2,853	0.65	0.70	31,615	0.91	0.98
Total	49,225	0.95	0.99	172,088	0.87	1.04	17,435	0.72	0.79	238,748	0.87	1.01

[1] Excludes experience from policies with a caregiver indemnity rider.

[2] Actual days utilization experience.

[3] Expected = assumption used in this filing reflecting all experience adjustments.

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513 Series Supplement to the Actuarial Memorandum

October 4, 2022

<u>Product</u>	<u>Number</u>
513 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-2-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-2-PA et al.

1. Purpose of Filing

This supplement has been prepared for the purpose of demonstrating that the requested rate increase complies with 40 Pa. Stat. Section 3801.303(c) and Reg. 89.83 of the Insurance Regulations for the state of Pennsylvania. It may not be appropriate for other purposes.

The experience provided in this supplement reflects actual nationwide or Pennsylvania-specific experience for 513 Series policies. Pennsylvania-specific experience is not considered as credible as nationwide but is being provided as required.

2. Demonstration of Compliance with 40 Pa. Stat. Section 3801.303

(c): We believe that we comply with this subsection of the regulation by submitting these rates before they are being used.

3. Demonstration of Compliance with Reg. 89.83

89.83 (a): This subsection requires no action.

89.83 (b): This subsection is not applicable since this filing is not for rates for a new policy form.

89.83 (c): Revision of Current Rates

(1): Policies issued on or after September 16, 2002 in Pennsylvania are subject to the loss ratio requirements specified in Reg. 89a.118.(c)(2), (i.e., the 58%/85% test). All policies issued in Pennsylvania on the above-referenced policy forms were issued after September 16, 2002. Demonstration of satisfaction of these requirements is discussed in Section 15 of the enclosed actuarial memorandum.

(2): Section 3 of the actuarial memorandum provides a description of benefits. Copies of the affected policy forms may be provided upon request.

(2)(i): Table 16.1 of the enclosed actuarial memorandum demonstrates that experience has been more adverse than that expected using original pricing assumptions as the actual-to-expected loss ratios exceed 1.0. The adverse experience is driven by higher-than-expected persistency and morbidity.

The company is requesting a premium rate increase as described in Section 2 of the enclosed actuarial memorandum.

Corresponding rate tables reflecting the current and proposed rate levels are enclosed with this filing. An Excel version of the rate tables is also enclosed and represents the rate basis the administrator will use in implementing this rate increase. Actual rates implemented may vary from those in the enclosed rate tables due to implementation rounding algorithms.

Attachment 1 provides actual and projected nationwide experience using current assumptions, as described in Section 6 of the actuarial memorandum. Included are calendar year earned premiums, incurred claims, annual loss ratios, end of year lives, and cumulative loss ratios with interest. Attachment 1 is the same as Exhibit I of the actuarial memorandum with a column added for cumulative loss ratios.

Attachment 2 provides nationwide experience showing written premium, paid claims, annual loss ratios and cumulative loss ratios. Values in Attachments 1 and 2 are shown both before and after the requested rate increase. The interest rate used in Attachments 1 and 2 to accumulate and discount values is the maximum valuation interest rate for contract reserves applicable for the year of issue (which ranges from 3.5% to 4.0%,

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and averages 3.5%).

Attachments 3 and 4 provide information similar to Attachments 1 and 2, respectively, for Pennsylvania-specific experience.

(2)(ii)(A): Nationwide, this is the first request for a rate increase on this block of business. No prior rate increases have been implemented on the above-referenced policy forms.

(2)(ii)(B): Expenses have not been reflected in the projections for this filing. Attachment 5 provides a description of the expense assumptions, including the commission scales for the products in this filing. The expense and commission assumptions are consistent with pricing assumptions.

(2)(ii)(C)(I): Premiums earned and written since inception for nationwide experience can be found in Attachments 1 and 2, respectively. Premiums earned and written since inception for Pennsylvania-specific experience can be found in Attachments 3 and 4, respectively. Attachment 6 provides reserve balances and the calculation basis for both nationwide and Pennsylvania-specific experience.

(2)(ii)(C)(II): Attachment 6 provides a breakdown of historical incurred claims and active life reserve balance, including a description of the calculation basis, for both nationwide and Pennsylvania-specific experience.

Attachment 7 provides actual and projected experience on a durational basis using current assumptions. Included are policy year earned premiums, incurred claims, durational loss ratios, end of year lives, and cumulative loss ratios with interest. Values are shown both before and after the requested rate increase. The number of durations shown was chosen to capture most of the durations underlying Attachment 1. The values used to calculate the cumulative loss ratios are accumulated and discounted at the maximum valuation interest rate, which is consistent with that used for Attachments 1 through 4.

Attachment 8 provides information like Attachment 7 for Pennsylvania-specific experience.

(2)(ii)(D): We believe that we have provided information sufficient to support the rate increase requested in this filing.

(2)(iii): We understand that data used in this rate increase filing agrees with that used in the annual statement filed with the department.

89.83 (d): We believe the proposed rate tables provided with this filing comply with this subsection.

4. Generally Requested Information

Pennsylvania Seriatim Listing

Attachment 9 provides a seriatim listing showing the issue date, issue age, attained age, benefit period, elimination period, inflation protection, uninflated daily benefit, current annualized premium, proposed annualized premium, and proposed increase for insureds in force in Pennsylvania on the above-referenced policy forms as of December 31, 2020. Please note that the actual premium levels and proposed increases may vary slightly from those provided in Attachment 9 due to implementation rounding algorithms.

Insureds Summary

As of December 31, 2020, the company has issued policies to 19,345 insureds on the above-referenced policy forms nationwide. As of December 31, 2020, 17,570 insureds remained in force with 17,552 being active premium-paying insureds (99.9% of insureds in force).

Reinsurance Summary

The 513 Series is reinsured 25% to LifeCare Assurance Company on a yearly renewable term basis, with claim reserves held by the reinsurer backed by assets in trust.

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Description of Attachments and Enclosures

Attachment 1: Nationwide Experience by Calendar Year Including Earned Premium and Incurred Claims
Attachment 2: Nationwide Experience by Calendar Year Including Written Premium and Paid Claims
Attachment 3: Pennsylvania-Specific Experience by Calendar Year Including Earned Premium and Incurred Claims
Attachment 4: Pennsylvania-Specific Experience by Calendar Year Including Written Premium and Paid Claims
Attachment 5: Expense Assumptions
Attachment 6: Breakdown of Nationwide and Pennsylvania-Specific Historical Incurred Claims and Reserve Balances
Attachment 7: Nationwide Experience by Policy Year
Attachment 8: Pennsylvania-Specific Experience by Policy Year
Attachment 9: Seriatim Listing

Enclosures: Attachments in Excel

Attachment 1-a
Massachusetts Mutual Life Insurance Company
Earned Premium and Incurred Claim Experience and Projections by Calendar Year
Nationwide Experience Before Requested Rate Increase
513 Series

		Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	Calendar Year	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2012	624	0	0%	4	0%
	2013	2,099,316	0	0%	1,818	0%
	2014	9,683,841	399,158	4%	4,776	3%
	2015	19,563,441	6,250	0%	8,271	1%
	2016	30,078,471	277,312	1%	11,501	1%
	2017	38,389,838	861,484	2%	13,909	2%
	2018	45,656,804	526,091	1%	16,063	1%
	2019	51,395,990	653,236	1%	17,282	1%
	2020	53,371,273	1,426,681	3%	17,570	2%
Projected Future Experience	2021	53,306,876	2,059,715	4%	17,256	2%
	2022	52,332,944	2,672,693	5%	16,991	2%
	2023	51,484,974	3,426,550	7%	16,763	3%
	2024	50,721,602	4,326,285	9%	16,555	3%
	2025	50,000,847	5,383,890	11%	16,355	4%
	2026	49,288,306	6,613,691	13%	16,158	5%
	2027	48,554,288	8,049,698	17%	15,954	6%
	2028	47,781,261	9,719,408	20%	15,738	6%
	2029	46,954,013	11,655,457	25%	15,509	7%
	2030	46,063,053	13,898,028	30%	15,264	8%
	2031	45,100,999	16,482,147	37%	15,000	10%
	2032	44,062,574	19,439,932	44%	14,717	11%
	2033	42,943,239	22,792,140	53%	14,412	12%
	2034	41,738,823	26,545,704	64%	14,084	14%
	2035	40,446,168	30,683,172	76%	13,731	16%
	2036	39,063,994	35,153,152	90%	13,351	18%
	2037	37,592,500	39,882,268	106%	12,943	20%
	2038	36,033,879	44,837,131	124%	12,505	22%
	2039	34,392,435	49,911,407	145%	12,039	25%
	2040	32,675,296	55,002,921	168%	11,544	27%
	2041	30,892,799	59,920,153	194%	11,021	30%
	2042	29,057,790	64,523,168	222%	10,473	33%
	2043	27,184,633	68,740,540	253%	9,903	36%
	2044	25,288,595	72,409,542	286%	9,315	38%
	2045	23,386,460	75,404,496	322%	8,713	41%
	2046	21,495,854	77,704,576	361%	8,102	44%
	2047	19,633,997	79,147,700	403%	7,489	47%
	2048	17,817,688	79,700,345	447%	6,878	50%
	2049	16,062,364	79,416,495	494%	6,276	52%
	2050	14,381,867	78,260,992	544%	5,688	55%
	2051	12,788,034	76,375,245	597%	5,119	57%
	2052	11,290,503	73,670,632	653%	4,576	59%
	2053	9,897,160	70,375,494	711%	4,061	61%
	2054	8,612,791	66,526,275	772%	3,578	63%
	2055	7,440,135	62,285,101	837%	3,130	65%
	2056-2060	23,440,565	241,598,954	1,031%	10,206	71%
	2061-2065	9,110,762	133,578,726	1,466%	4,253	74%
	2066-2070	2,908,842	58,729,115	2,019%	1,474	75%
	2071-2075	757,970	20,161,334	2,660%	421	75%
	2076-2080	162,068	5,418,363	3,343%	100	75%

With Interest Accum./Disc. To 12/31/2020			
History	275,057,788	4,514,791	2%
Future	784,550,362	790,156,009	101%
Lifetime	1,059,608,150	794,670,800	75%

Attachment 1-b
Massachusetts Mutual Life Insurance Company
Earned Premium and Incurred Claim Experience and Projections by Calendar Year
Nationwide Experience After Requested Rate Increase
513 Series

		Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	Calendar Year	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2012	624	0	0%	4	0%
	2013	2,099,316	0	0%	1,818	0%
	2014	9,683,841	399,158	4%	4,776	3%
	2015	19,563,441	6,250	0%	8,271	1%
	2016	30,078,471	277,312	1%	11,501	1%
	2017	38,389,838	861,484	2%	13,909	2%
	2018	45,656,804	526,091	1%	16,063	1%
	2019	51,395,990	653,236	1%	17,282	1%
	2020	53,371,273	1,426,681	3%	17,570	2%
Projected Future Experience	2021	53,306,876	2,048,066	4%	17,256	2%
	2022	52,332,944	2,657,224	5%	16,991	2%
	2023	53,146,820	3,402,879	6%	16,681	3%
	2024	60,787,154	4,274,373	7%	16,394	3%
	2025	61,077,599	5,314,578	9%	16,196	4%
	2026	60,214,049	6,527,348	11%	16,000	4%
	2027	59,325,456	7,943,224	13%	15,798	5%
	2028	58,389,734	9,588,972	16%	15,584	6%
	2029	57,388,130	11,496,499	20%	15,357	7%
	2030	56,308,809	13,704,976	24%	15,113	8%
	2031	55,142,718	16,248,740	29%	14,851	9%
	2032	53,883,167	19,159,044	36%	14,570	10%
	2033	52,524,437	22,456,041	43%	14,268	11%
	2034	51,061,259	26,146,005	51%	13,942	13%
	2035	49,489,577	30,211,262	61%	13,591	14%
	2036	47,807,640	34,600,930	72%	13,214	16%
	2037	46,015,586	39,242,359	85%	12,808	18%
	2038	44,115,978	44,102,370	100%	12,374	20%
	2039	42,113,965	49,075,946	117%	11,911	22%
	2040	40,018,215	54,062,172	135%	11,419	24%
	2041	37,841,323	58,873,080	156%	10,900	26%
	2042	35,599,044	63,371,426	178%	10,357	29%
	2043	33,309,020	67,487,124	203%	9,792	31%
	2044	30,990,036	71,060,440	229%	9,208	34%
	2045	28,662,688	73,969,081	258%	8,611	36%
	2046	26,348,636	76,193,530	289%	8,006	38%
	2047	24,069,080	77,575,594	322%	7,398	41%
	2048	21,844,708	78,083,350	357%	6,792	43%
	2049	19,694,525	77,771,136	395%	6,196	45%
	2050	17,635,590	76,605,706	434%	5,614	48%
	2051	15,682,507	74,726,630	476%	5,052	50%
	2052	13,847,177	72,048,087	520%	4,514	51%
	2053	12,139,340	68,794,582	567%	4,005	53%
	2054	10,564,911	65,002,358	615%	3,527	55%
	2055	9,127,287	60,830,638	666%	3,084	56%
	2056-2060	28,763,505	235,655,358	819%	10,051	61%
	2061-2065	11,185,009	129,996,190	1,162%	4,182	64%
	2066-2070	3,571,610	57,011,153	1,596%	1,447	65%
	2071-2075	930,174	19,517,051	2,098%	413	65%
	2076-2080	198,871	5,232,308	2,631%	98	65%

With Interest Accum./Disc. To 12/31/2020			
History	275,057,788	4,514,791	2%
Future	926,857,180	774,870,961	84%
Lifetime	1,201,914,968	779,385,752	65%

Projected incurred claims in 2021 and 2022 are different from those in the before increase projections due to an immaterial modeling simplification in the application of the assumed reduced benefit option elections.

Attachment 2-a
Massachusetts Mutual Life Insurance Company
Written Premium and Paid Claim Experience and Projections by Calendar Year
Nationwide Experience Before Requested Rate Increase
513 Series

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2012	3,010	0	0%	0%
	2013	4,053,032	0	0%	0%
	2014	12,621,407	41,451	0%	0%
	2015	23,004,218	77,811	0%	0%
	2016	33,001,213	80,939	0%	0%
	2017	40,564,268	157,101	0%	0%
	2018	47,611,483	245,859	1%	0%
	2019	52,271,304	453,553	1%	0%
	2020	53,827,999	631,960	1%	1%
Projected Future Experience	2021	53,014,373	1,436,478	3%	1%
	2022	52,076,618	1,210,985	2%	1%
	2023	51,260,019	1,826,650	4%	1%
	2024	50,514,242	2,545,111	5%	2%
	2025	49,799,522	3,316,387	7%	2%
	2026	49,084,772	4,276,935	9%	3%
	2027	48,342,398	5,419,341	11%	3%
	2028	47,555,766	6,687,744	14%	4%
	2029	46,711,675	8,178,700	18%	4%
	2030	45,801,469	9,925,644	22%	5%
	2031	44,818,622	11,923,705	27%	6%
	2032	43,758,021	14,255,600	33%	7%
	2033	42,615,309	16,946,394	40%	8%
	2034	41,386,551	20,029,540	48%	10%
	2035	40,068,951	23,521,446	59%	11%
	2036	38,661,837	27,429,075	71%	12%
	2037	37,165,979	31,748,419	85%	14%
	2038	35,583,913	36,451,609	102%	16%
	2039	33,920,784	41,486,442	122%	18%
	2040	32,184,640	46,783,814	145%	20%
	2041	30,386,464	52,232,692	172%	23%
	2042	28,539,791	57,707,315	202%	25%
	2043	26,659,321	63,074,493	237%	28%
	2044	24,760,491	68,184,341	275%	31%
	2045	22,860,525	72,887,846	319%	33%
	2046	20,976,906	77,034,476	367%	36%
	2047	19,126,628	80,513,497	421%	39%
	2048	17,326,444	83,211,363	480%	42%
	2049	15,591,116	85,049,126	545%	45%
	2050	13,934,187	85,968,762	617%	47%
	2051	12,366,713	85,944,819	695%	50%
	2052	10,897,867	84,994,599	780%	53%
	2053	9,534,788	83,165,633	872%	55%
	2054	8,281,553	80,542,641	973%	57%
	2055	7,140,417	77,205,961	1,081%	59%
	2056-2060	22,383,764	319,202,776	1,426%	67%
	2061-2065	8,620,375	196,133,697	2,275%	72%
	2066-2070	2,727,371	96,842,823	3,551%	73%
	2071-2075	703,901	37,642,829	5,348%	74%
	2076-2080	148,914	11,389,433	7,648%	74%

With Interest Accum./Disc. To 12/31/2020			
History	294,802,375	1,805,986	1%
Future	777,083,166	791,691,563	102%
Lifetime	1,071,885,541	793,497,548	74%

Attachment 2-b
Massachusetts Mutual Life Insurance Company
Written Premium and Paid Claim Experience and Projections by Calendar Year
Nationwide Experience After Requested Rate Increase
513 Series

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2012	3,010	0	0%	0%
	2013	4,053,032	0	0%	0%
	2014	12,621,407	41,451	0%	0%
	2015	23,004,218	77,811	0%	0%
	2016	33,001,213	80,939	0%	0%
	2017	40,564,268	157,101	0%	0%
	2018	47,611,483	245,859	1%	0%
	2019	52,271,304	453,553	1%	0%
	2020	53,827,999	631,960	1%	1%
Projected Future Experience	2021	53,014,373	1,436,478	3%	1%
	2022	52,076,618	1,210,985	2%	1%
	2023	55,375,723	1,826,484	3%	1%
	2024	61,269,697	2,539,123	4%	2%
	2025	60,832,817	3,292,751	5%	2%
	2026	59,966,742	4,235,694	7%	2%
	2027	59,068,080	5,350,559	9%	3%
	2028	58,115,800	6,600,581	11%	3%
	2029	57,093,614	8,069,785	14%	4%
	2030	55,990,690	9,788,646	17%	5%
	2031	54,799,061	11,759,712	21%	6%
	2032	53,512,218	14,057,284	26%	6%
	2033	52,124,677	16,707,627	32%	7%
	2034	50,631,447	19,743,690	39%	8%
	2035	49,028,912	23,178,866	47%	10%
	2036	47,316,103	27,020,707	57%	11%
	2037	45,493,842	31,265,199	69%	13%
	2038	43,565,116	35,884,278	82%	14%
	2039	41,536,125	40,826,168	98%	16%
	2040	39,416,670	46,022,328	117%	18%
	2041	37,220,159	51,363,224	138%	20%
	2042	34,963,202	56,725,081	162%	22%
	2043	32,663,861	61,976,750	190%	24%
	2044	30,341,127	66,971,016	221%	27%
	2045	28,016,154	71,561,886	255%	29%
	2046	25,710,440	75,602,220	294%	32%
	2047	23,444,914	78,983,968	337%	34%
	2048	21,240,195	81,596,418	384%	36%
	2049	19,114,463	83,363,283	436%	39%
	2050	17,084,415	84,228,793	493%	41%
	2051	15,163,687	84,169,424	555%	44%
	2052	13,363,625	83,203,055	623%	46%
	2053	11,693,015	81,377,483	696%	48%
	2054	10,156,908	78,776,933	776%	50%
	2055	8,758,090	75,480,735	862%	52%
	2056-2060	27,461,736	311,684,117	1,135%	58%
	2061-2065	10,581,065	191,101,469	1,806%	62%
	2066-2070	3,348,187	94,143,634	2,812%	63%
	2071-2075	863,647	36,499,058	4,226%	64%
	2076-2080	182,702	11,014,158	6,028%	64%

With Interest Accum./Disc. To 12/31/2020			
History	294,802,375	1,805,986	1%
Future	920,781,954	776,430,260	84%
Lifetime	1,215,584,329	778,236,246	64%

Attachment 3-a
Massachusetts Mutual Life Insurance Company
Earned Premium and Incurred Claim Experience and Projections by Calendar Year
Pennsylvania-Specific Experience Before Requested Rate Increase
513 Series

		Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	Calendar Year	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2012	29	0	0%	1	0%
	2013	152,633	0	0%	126	0%
	2014	619,296	399,158	64%	276	51%
	2015	1,073,851	0	0%	427	22%
	2016	1,487,366	0	0%	534	12%
	2017	1,780,709	217,245	12%	641	12%
	2018	2,043,183	153,867	8%	722	11%
	2019	2,244,754	0	0%	747	9%
	2020	2,215,513	0	0%	739	7%
Projected Future Experience	2021	2,189,673	102,608	5%	726	7%
	2022	2,152,038	132,589	6%	716	7%
	2023	2,118,885	169,696	8%	707	7%
	2024	2,088,171	213,894	10%	698	7%
	2025	2,058,149	265,574	13%	689	8%
	2026	2,027,413	325,685	16%	681	8%
	2027	1,995,250	394,534	20%	672	9%
	2028	1,960,812	474,022	24%	663	10%
	2029	1,923,525	566,250	29%	652	11%
	2030	1,883,132	673,138	36%	641	12%
	2031	1,839,420	795,693	43%	629	13%
	2032	1,792,225	934,245	52%	617	15%
	2033	1,741,368	1,087,568	62%	603	16%
	2034	1,686,691	1,261,689	75%	588	18%
	2035	1,628,017	1,456,090	89%	572	20%
	2036	1,565,273	1,661,811	106%	555	22%
	2037	1,498,622	1,881,750	126%	536	24%
	2038	1,428,251	2,099,989	147%	516	27%
	2039	1,354,480	2,314,162	171%	495	30%
	2040	1,277,744	2,528,117	198%	472	32%
	2041	1,198,582	2,720,003	227%	448	35%
	2042	1,117,677	2,901,143	260%	424	38%
	2043	1,035,802	3,051,368	295%	398	41%
	2044	953,763	3,162,212	332%	372	44%
	2045	872,392	3,249,777	373%	345	47%
	2046	792,422	3,287,972	415%	318	50%
	2047	714,699	3,304,782	462%	291	53%
	2048	639,933	3,271,573	511%	264	55%
	2049	568,805	3,181,646	559%	239	58%
	2050	501,845	3,067,114	611%	214	60%
	2051	439,381	2,913,632	663%	190	62%
	2052	381,695	2,762,142	724%	168	64%
	2053	329,008	2,588,638	787%	147	66%
	2054	281,446	2,381,167	846%	128	67%
	2055	238,993	2,180,268	912%	110	69%
	2056-2060	719,750	7,923,412	1,101%	347	73%
	2061-2065	260,581	3,926,317	1,507%	138	75%
	2066-2070	80,723	1,616,224	2,002%	48	76%
	2071-2075	21,673	544,323	2,512%	15	76%
	2076-2080	5,101	143,767	2,818%	4	76%

With Interest Accum./Disc. To 12/31/2020			
History	12,859,158	911,908	7%
Future	31,424,734	32,918,053	105%
Lifetime	44,283,892	33,829,960	76%

Attachment 3-b
Massachusetts Mutual Life Insurance Company
Earned Premium and Incurred Claim Experience and Projections by Calendar Year
Pennsylvania-Specific Experience After Requested Rate Increase
513 Series

	Calendar Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2012	29	0	0%	1	0%
	2013	152,633	0	0%	126	0%
	2014	619,296	399,158	64%	276	51%
	2015	1,073,851	0	0%	427	22%
	2016	1,487,366	0	0%	534	12%
	2017	1,780,709	217,245	12%	641	12%
	2018	2,043,183	153,867	8%	722	11%
	2019	2,244,754	0	0%	747	9%
	2020	2,215,513	0	0%	739	7%
Projected Future Experience	2021	2,189,673	101,928	5%	726	7%
	2022	2,152,038	131,688	6%	716	7%
	2023	2,193,684	168,322	8%	703	7%
	2024	2,535,748	210,959	8%	691	7%
	2025	2,550,477	261,692	10%	682	7%
	2026	2,512,534	320,882	13%	674	8%
	2027	2,472,853	388,663	16%	665	8%
	2028	2,430,373	466,895	19%	655	9%
	2029	2,384,377	557,636	23%	645	10%
	2030	2,334,545	662,755	28%	634	11%
	2031	2,280,615	783,253	34%	623	12%
	2032	2,222,389	919,419	41%	610	13%
	2033	2,159,636	1,070,049	50%	596	14%
	2034	2,092,155	1,241,027	59%	581	16%
	2035	2,019,719	1,431,795	71%	565	18%
	2036	1,942,227	1,633,562	84%	548	19%
	2037	1,859,875	1,849,129	99%	530	21%
	2038	1,772,881	2,062,855	116%	510	24%
	2039	1,681,632	2,272,318	135%	489	26%
	2040	1,586,662	2,481,370	156%	466	28%
	2041	1,488,646	2,668,573	179%	443	31%
	2042	1,388,423	2,845,044	205%	418	33%
	2043	1,286,933	2,991,051	232%	393	36%
	2044	1,185,178	3,098,167	261%	367	38%
	2045	1,084,187	3,182,369	294%	340	41%
	2046	984,883	3,218,162	327%	314	43%
	2047	888,326	3,232,894	364%	287	46%
	2048	795,402	3,198,681	402%	261	48%
	2049	706,969	3,109,104	440%	235	50%
	2050	623,693	2,995,613	480%	211	52%
	2051	545,989	2,844,234	521%	187	54%
	2052	474,216	2,694,938	568%	165	55%
	2053	408,658	2,524,366	618%	144	57%
	2054	349,477	2,320,891	664%	126	58%
	2055	296,660	2,124,080	716%	108	59%
	2056-2060	892,351	7,710,208	864%	341	63%
	2061-2065	322,094	3,814,314	1,184%	135	65%
	2066-2070	99,394	1,567,783	1,577%	47	66%
	2071-2075	26,564	526,972	1,984%	15	66%
	2076-2080	6,229	139,051	2,232%	4	66%

With Interest Accum./Disc. To 12/31/2020			
History	12,859,158	911,908	7%
Future	37,524,759	32,242,404	86%
Lifetime	50,383,917	33,154,312	66%

Projected incurred claims in 2021 and 2022 are different from those in the before increase projections due to an immaterial modeling simplification in the application of the assumed reduced benefit option elections.

Attachment 4-a
Massachusetts Mutual Life Insurance Company
Written Premium and Paid Claim Experience and Projections by Calendar Year
Pennsylvania-Specific Experience Before Requested Rate Increase
513 Series

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2012	1,776	0	0%	0%
	2013	328,935	0	0%	0%
	2014	741,627	41,451	6%	4%
	2015	1,240,406	76,575	6%	5%
	2016	1,609,377	70,939	4%	5%
	2017	1,872,501	78,413	4%	5%
	2018	2,098,387	82,315	4%	4%
	2019	2,223,901	150,198	7%	5%
	2020	2,212,286	175,284	8%	5%
Projected Future Experience	2021	2,177,524	144,447	7%	6%
	2022	2,141,386	64,699	3%	5%
	2023	2,109,151	96,314	5%	5%
	2024	2,078,837	134,904	6%	5%
	2025	2,048,603	157,760	8%	5%
	2026	2,017,415	205,818	10%	6%
	2027	1,984,596	262,662	13%	6%
	2028	1,949,281	327,025	17%	7%
	2029	1,911,043	400,941	21%	7%
	2030	1,869,621	485,683	26%	8%
	2031	1,824,832	582,670	32%	9%
	2032	1,776,512	693,630	39%	10%
	2033	1,724,494	820,359	48%	12%
	2034	1,668,634	965,291	58%	13%
	2035	1,608,798	1,128,869	70%	14%
	2036	1,544,992	1,311,474	85%	16%
	2037	1,477,380	1,512,023	102%	18%
	2038	1,406,155	1,728,989	123%	20%
	2039	1,331,675	1,957,800	147%	22%
	2040	1,254,409	2,193,508	175%	25%
	2041	1,174,918	2,430,438	207%	27%
	2042	1,093,938	2,660,001	243%	30%
	2043	1,012,265	2,874,706	284%	33%
	2044	930,659	3,069,691	330%	36%
	2045	849,891	3,239,650	381%	39%
	2046	770,710	3,378,843	438%	42%
	2047	693,931	3,479,872	501%	45%
	2048	620,269	3,538,315	570%	48%
	2049	550,389	3,552,833	646%	50%
	2050	484,751	3,525,124	727%	53%
	2051	423,651	3,456,661	816%	56%
	2052	367,366	3,348,271	911%	58%
	2053	316,088	3,207,880	1,015%	60%
	2054	269,899	3,041,003	1,127%	62%
	2055	228,739	2,851,468	1,247%	64%
	2056-2060	685,248	11,051,424	1,613%	71%
	2061-2065	245,536	6,045,570	2,462%	74%
	2066-2070	75,258	2,707,705	3,598%	75%
	2071-2075	20,046	985,406	4,916%	75%
	2076-2080	4,718	279,566	5,925%	75%

With Interest Accum./Disc. To 12/31/2020			
History	13,724,926	741,811	5%
Future	31,089,939	33,044,949	106%
Lifetime	44,814,865	33,786,760	75%

Attachment 4-b
Massachusetts Mutual Life Insurance Company
Written Premium and Paid Claim Experience and Projections by Calendar Year
Pennsylvania-Specific Experience After Requested Rate Increase
513 Series

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2012	1,776	0	0%	0%
	2013	328,935	0	0%	0%
	2014	741,627	41,451	6%	4%
	2015	1,240,406	76,575	6%	5%
	2016	1,609,377	70,939	4%	5%
	2017	1,872,501	78,413	4%	5%
	2018	2,098,387	82,315	4%	4%
	2019	2,223,901	150,198	7%	5%
	2020	2,212,286	175,284	8%	5%
Projected Future Experience	2021	2,177,524	144,447	7%	6%
	2022	2,141,386	64,699	3%	5%
	2023	2,290,408	96,302	4%	5%
	2024	2,558,139	134,555	5%	5%
	2025	2,538,758	156,481	6%	5%
	2026	2,500,271	203,437	8%	5%
	2027	2,459,791	258,966	11%	6%
	2028	2,416,235	322,129	13%	6%
	2029	2,369,071	394,784	17%	7%
	2030	2,317,977	478,200	21%	8%
	2031	2,262,730	573,664	25%	8%
	2032	2,203,124	682,843	31%	9%
	2033	2,138,948	807,511	38%	10%
	2034	2,070,013	950,018	46%	11%
	2035	1,996,149	1,110,724	56%	13%
	2036	1,917,349	1,290,021	67%	14%
	2037	1,833,810	1,486,825	81%	16%
	2038	1,745,757	1,699,607	97%	18%
	2039	1,653,624	1,923,825	116%	20%
	2040	1,557,991	2,154,608	138%	22%
	2041	1,459,557	2,386,380	164%	24%
	2042	1,359,219	2,610,722	192%	26%
	2043	1,257,956	2,820,222	224%	29%
	2044	1,156,709	3,010,171	260%	31%
	2045	1,056,440	3,175,380	301%	34%
	2046	958,087	3,310,260	346%	36%
	2047	862,677	3,407,590	395%	39%
	2048	771,102	3,463,140	449%	41%
	2049	684,196	3,475,606	508%	44%
	2050	602,542	3,446,762	572%	46%
	2051	526,514	3,378,158	642%	48%
	2052	456,469	3,270,613	717%	50%
	2053	392,651	3,131,964	798%	52%
	2054	335,171	2,967,614	885%	54%
	2055	283,955	2,781,362	980%	55%
	2056-2060	849,641	10,766,620	1,267%	61%
	2061-2065	303,549	5,878,964	1,937%	64%
	2066-2070	92,709	2,629,046	2,836%	65%
	2071-2075	24,597	954,887	3,882%	65%
	2076-2080	5,776	270,417	4,682%	65%

With Interest Accum./Disc. To 12/31/2020			
History	13,724,926	741,811	5%
Future	37,247,813	32,369,855	87%
Lifetime	50,972,739	33,111,666	65%

Attachment 5
Massachusetts Mutual Life Insurance Company
Expenses and Commissions
513 Series

Per Policy Expense

Issue Age	First Year
<45	\$675
45 to 54	\$675
55 to 59	\$700
60 to 64	\$740
65 to 69	\$915
70 to 74	\$1,365
75 to 79	\$2,115
80+	\$3,200
	Renewal Years
	\$60

Percent of Premium Expense*

First Year
6.00%
Renewal Years
6.00%

* Includes premium tax

Percent of Paid Claim Expense

5.00%

Other Sales Expense

Policy Year	Percent of Premium
1	95.20%
2	1.00%
3	0.80%
4	0.60%
5	0.60%
6	0.60%
7	0.60%
8	0.60%
9	0.60%
10	0.60%
11+	0.20%

Commission Schedule*

Policy Duration	Percent of Premium
1**	50%
2 - 10	6%
11+	1%

*Commissions are not paid on the increased premium

**Percent of premium is 40% in year 1 for policies with a multi-life discount.

Attachment 6-a
Massachusetts Mutual Life Insurance Company
Breakdown of Nationwide Historical Incurred Claims and Reserve Balances
513 Series

Incurred Year	Discounted to the Year of Incurral					Year-End Active Life Reserve ^[3]
	Incurred Claims ^[1]	Paid Claims	Disabled Life Reserve	IBNR Reserve	Total Claim Reserve ^[2]	
2012	0	0	0		0	
2013	0	0	0		0	
2014	399,158	399,158	0		0	
2015	6,250	6,250	0		0	
2016	277,312	277,312	0		0	
2017	861,484	600,969	260,515		260,515	
2018	526,091	347,175	178,917		178,917	
2019	653,236	340,775	312,461		312,461	
2020	1,426,681	285,389	1,141,293	0	1,141,293	123,139,655

[1] Incurred claims are the sum of paid claims, disabled life reserve, and incurred but not reported (IBNR) reserve.

[2] Claim reserve is the sum of disabled life reserve and IBNR reserve; IBNR reserve is zero as runout and claim reserve balances as of December 31, 2021 are used.

[3] Active Life Reserve is defined as interpolated terminal reserves plus unearned premium reserves.

Attachment 6-b
Massachusetts Mutual Life Insurance Company
Breakdown of Pennsylvania-Specific Historical Incurred Claims and Reserve Balances
513 Series

Incurred Year	Discounted to the Year of Incurral					Year-End Active Life Reserve ^[3]
	Incurred Claims ^[1]	Paid Claims	Disabled Life Reserve	IBNR Reserve	Total Claim Reserve ^[2]	
2012	0	0	0		0	
2013	0	0	0		0	
2014	399,158	399,158	0		0	
2015	0	0	0		0	
2016	0	0	0		0	
2017	217,245	154,382	62,863		62,863	
2018	153,867	153,867	0		0	
2019	0	0	0		0	
2020	0	0	0	0	0	5,862,296

[1] Incurred claims are the sum of paid claims, disabled life reserve, and incurred but not reported (IBNR) reserve.

[2] Claim reserve is the sum of disabled life reserve and IBNR reserve; IBNR reserve is zero as runout and claim reserve balances as of December 31, 2021 are used.

[3] Active Life Reserve is defined as interpolated terminal reserves plus unearned premium reserves.

Attachment 7-a
Massachusetts Mutual Life Insurance Company
Nationwide Experience and Projections by Policy Year - Before Requested Rate Increase
513 Series

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
1	59,076,046	431,728	1%	19,039	1%
2	57,194,156	255,409	0%	18,500	1%
3	55,677,925	913,094	2%	18,070	1%
4	54,331,427	1,014,791	2%	17,660	1%
5	53,145,570	1,374,418	3%	17,330	1%
6	52,184,769	2,385,901	5%	17,072	2%
7	51,450,391	2,427,820	5%	16,841	2%
8	50,844,101	3,837,677	8%	16,643	3%
9	50,331,860	4,550,107	9%	16,461	3%
10	49,683,494	5,740,679	12%	16,278	4%
11	49,002,198	7,000,116	14%	16,086	5%
12	48,275,138	8,464,997	18%	15,882	5%
13	47,493,579	10,181,396	21%	15,665	6%
14	46,648,061	12,196,504	26%	15,432	7%
15	45,731,416	14,547,994	32%	15,181	8%
16	44,739,062	17,266,321	39%	14,911	10%
17	43,667,034	20,395,305	47%	14,621	11%
18	42,509,229	23,972,728	56%	14,308	13%
19	41,263,627	27,963,746	68%	13,972	14%
20	39,927,456	32,350,768	81%	13,609	16%
21	38,497,354	37,063,787	96%	13,218	18%
22	36,973,301	42,041,493	114%	12,798	21%
23	35,360,631	47,215,696	134%	12,347	23%
24	33,664,961	52,472,781	156%	11,866	25%
25	31,893,961	57,720,295	181%	11,355	28%
26	30,058,706	62,730,240	209%	10,817	31%
27	28,173,899	67,467,309	239%	10,253	34%
28	26,255,668	71,678,410	273%	9,667	37%
29	24,322,823	75,111,610	309%	9,064	39%
30	22,394,053	77,882,923	348%	8,449	42%
31	20,486,650	79,804,626	390%	7,827	45%
32	18,617,246	80,964,054	435%	7,204	48%
33	16,802,306	81,243,121	484%	6,586	51%
34	15,057,382	80,418,379	534%	5,980	53%
35	13,397,930	78,768,436	588%	5,392	56%
36	11,835,236	76,315,950	645%	4,826	58%
37	10,377,941	73,136,486	705%	4,288	60%
38	9,032,122	69,337,829	768%	3,781	62%
39	7,801,220	65,100,769	834%	3,309	64%
40	6,686,477	60,447,768	904%	2,875	66%
41	5,687,245	55,563,303	977%	2,478	67%
42	4,800,549	50,562,590	1,053%	2,121	68%
43	4,021,388	45,553,714	1,133%	1,802	69%
44	3,343,204	40,707,746	1,218%	1,519	70%
45	2,758,430	35,964,992	1,304%	1,272	71%
46	2,258,987	31,542,398	1,396%	1,057	72%
47	1,835,979	27,461,225	1,496%	872	73%
48	1,480,828	23,714,095	1,601%	715	73%
49	1,185,274	20,316,802	1,714%	581	73%
50	941,623	17,192,050	1,826%	470	74%
51-55	2,401,584	50,677,253	2,110%	1,254	75%
56-60	645,060	17,598,632	2,728%	368	75%
61-65	152,333	5,173,739	3,396%	96	75%
66-70	9,656	410,846	4,255%	7	75%
Total	1,452,388,546	1,956,632,846	135%	500,073	75%

Attachment 7-b
Massachusetts Mutual Life Insurance Company
Nationwide Experience and Projections by Policy Year - After Requested Rate Increase
513 Series

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
1	59,076,046	431,692	1%	19,039	1%
2	57,194,156	255,175	0%	18,500	1%
3	55,710,930	912,161	2%	18,068	1%
4	54,574,187	1,012,408	2%	17,655	1%
5	53,961,958	1,369,265	3%	17,313	1%
6	54,278,946	2,375,309	4%	17,034	2%
7	55,095,371	2,408,757	4%	16,780	2%
8	56,227,773	3,806,413	7%	16,554	3%
9	57,679,947	4,503,039	8%	16,343	3%
10	58,816,104	5,674,062	10%	16,137	4%
11	59,362,657	6,911,940	12%	15,933	4%
12	58,934,203	8,354,370	14%	15,727	5%
13	58,046,722	10,045,850	17%	15,511	6%
14	57,023,581	12,031,344	21%	15,280	7%
15	55,913,843	14,347,380	26%	15,031	8%
16	54,711,676	17,023,586	31%	14,763	9%
17	53,412,134	20,102,720	38%	14,474	10%
18	52,007,511	23,621,468	45%	14,164	11%
19	50,495,061	27,545,114	55%	13,830	13%
20	48,871,185	31,855,636	65%	13,470	14%
21	47,131,597	36,483,824	77%	13,082	16%
22	45,276,125	41,368,849	91%	12,664	18%
23	43,311,182	46,443,087	107%	12,216	20%
24	41,243,479	51,594,909	125%	11,739	22%
25	39,082,264	56,732,693	145%	11,232	25%
26	36,841,007	61,632,347	167%	10,697	27%
27	34,537,693	66,259,272	192%	10,138	29%
28	32,192,135	70,365,340	219%	9,557	32%
29	29,827,457	73,704,274	247%	8,959	34%
30	27,466,629	76,390,344	278%	8,349	37%
31	25,130,957	78,240,585	311%	7,732	39%
32	22,840,981	79,341,118	347%	7,115	42%
33	20,617,019	79,578,055	386%	6,503	44%
34	18,478,239	78,733,959	426%	5,903	46%
35	16,443,699	77,082,443	469%	5,320	48%
36	14,527,354	74,647,190	514%	4,761	50%
37	12,739,932	71,502,695	561%	4,228	52%
38	11,089,014	67,756,292	611%	3,728	54%
39	9,578,877	63,585,653	664%	3,261	55%
40	8,211,073	59,012,530	719%	2,832	57%
41	6,984,852	54,217,495	776%	2,441	58%
42	5,896,595	49,313,524	836%	2,088	59%
43	4,940,208	44,406,529	899%	1,773	60%
44	4,107,663	39,663,078	966%	1,495	61%
45	3,389,683	35,024,887	1,033%	1,251	62%
46	2,776,365	30,703,197	1,106%	1,039	62%
47	2,256,803	26,717,918	1,184%	857	63%
48	1,820,495	23,061,257	1,267%	702	63%
49	1,457,326	19,747,971	1,355%	571	63%
50	1,157,874	16,702,634	1,443%	462	64%
51-55	2,953,548	49,173,922	1,665%	1,230	64%
56-60	793,270	17,041,766	2,148%	361	65%
61-65	187,501	5,004,031	2,669%	94	65%
66-70	11,866	396,684	3,343%	7	65%
Total	1,686,694,755	1,916,218,044	114%	495,991	65%

Attachment 8-a
Massachusetts Mutual Life Insurance Company
Pennsylvania-Specific Experience and Projections by Policy Year - Before Requested Rate Increase
513 Series

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
1	2,432,393	399,158	16%	791	16%
2	2,352,122	104	0%	775	8%
3	2,308,681	157,533	7%	760	8%
4	2,253,397	10,760	0%	748	6%
5	2,213,985	240,063	11%	734	7%
6	2,155,015	47,997	2%	723	6%
7	2,130,482	86,063	4%	716	6%
8	2,107,244	141,797	7%	706	6%
9	2,090,724	195,291	9%	699	6%
10	2,063,602	247,604	12%	691	7%
11	2,034,900	303,659	15%	683	7%
12	2,004,058	368,384	18%	674	8%
13	1,970,738	444,582	23%	665	9%
14	1,934,533	534,130	28%	655	10%
15	1,895,064	639,196	34%	644	11%
16	1,852,115	761,157	41%	632	12%
17	1,805,518	900,253	50%	620	14%
18	1,755,020	1,058,774	60%	606	15%
19	1,700,555	1,234,569	73%	591	17%
20	1,641,998	1,428,598	87%	576	19%
21	1,579,205	1,639,176	104%	558	21%
22	1,512,191	1,861,923	123%	540	23%
23	1,441,225	2,086,818	145%	520	26%
24	1,366,625	2,313,812	169%	499	29%
25	1,288,781	2,537,496	197%	476	31%
26	1,208,283	2,744,746	227%	452	34%
27	1,125,847	2,941,544	261%	427	37%
28	1,042,297	3,096,757	297%	401	40%
29	958,595	3,220,649	336%	374	43%
30	875,590	3,310,154	378%	347	46%
31	794,075	3,347,306	422%	319	49%
32	714,871	3,369,069	471%	292	52%
33	638,663	3,331,866	522%	265	55%
34	566,175	3,256,699	575%	239	57%
35	498,038	3,150,678	633%	213	60%
36	434,614	2,990,710	688%	189	62%
37	376,215	2,823,115	750%	166	64%
38	323,009	2,629,691	814%	145	66%
39	275,054	2,423,027	881%	126	68%
40	232,320	2,213,530	953%	108	69%
41	194,668	1,994,309	1,024%	92	70%
42	161,851	1,778,394	1,099%	78	71%
43	133,553	1,575,485	1,180%	65	72%
44	109,389	1,376,555	1,258%	54	73%
45	88,954	1,187,917	1,335%	45	74%
46	71,854	1,018,488	1,417%	37	74%
47	57,648	866,944	1,504%	30	75%
48	45,938	737,706	1,606%	25	75%
49	36,371	622,023	1,710%	20	75%
50	28,630	517,444	1,807%	16	76%
51-55	72,150	1,474,306	2,043%	44	76%
56-60	19,847	491,141	2,475%	15	76%
61-65	5,362	141,023	2,630%	5	76%
66-70	711	16,679	2,347%	1	76%
Total	58,980,743	78,286,854	133%	20,872	76%

Attachment 8-b
Massachusetts Mutual Life Insurance Company
Pennsylvania-Specific Experience and Projections by Policy Year - After Requested Rate Increase
513 Series

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
1	2,432,393	399,158	16%	791	16%
2	2,352,122	103	0%	775	8%
3	2,308,681	157,506	7%	760	8%
4	2,253,397	10,682	0%	748	6%
5	2,222,631	239,896	11%	734	7%
6	2,214,594	47,597	2%	722	6%
7	2,254,497	85,289	4%	714	6%
8	2,301,210	140,431	6%	703	6%
9	2,369,752	193,152	8%	694	6%
10	2,430,721	244,525	10%	685	7%
11	2,483,810	299,415	12%	676	7%
12	2,478,788	362,995	15%	667	8%
13	2,442,617	437,968	18%	657	8%
14	2,397,949	526,090	22%	648	9%
15	2,349,252	629,453	27%	637	10%
16	2,296,258	749,393	33%	625	11%
17	2,238,758	886,126	40%	613	12%
18	2,176,436	1,041,890	48%	599	14%
19	2,109,205	1,214,549	58%	585	15%
20	2,036,906	1,405,009	69%	569	17%
21	1,959,353	1,611,586	82%	552	19%
22	1,876,557	1,829,936	98%	533	21%
23	1,788,838	2,050,208	115%	514	23%
24	1,696,583	2,272,323	134%	493	25%
25	1,600,264	2,490,972	156%	470	27%
26	1,500,605	2,693,204	179%	446	30%
27	1,398,484	2,884,951	206%	421	32%
28	1,294,924	3,035,727	234%	396	35%
29	1,191,110	3,155,632	265%	369	38%
30	1,088,095	3,241,700	298%	342	40%
31	986,875	3,276,350	332%	315	43%
32	888,477	3,295,876	371%	288	45%
33	793,759	3,257,771	410%	261	47%
34	703,630	3,182,529	452%	235	50%
35	618,887	3,077,214	497%	210	52%
36	539,992	2,919,424	541%	186	54%
37	467,338	2,754,359	589%	164	55%
38	401,142	2,564,302	639%	143	57%
39	341,479	2,361,528	692%	123	58%
40	288,316	2,156,260	748%	106	59%
41	241,487	1,941,793	804%	90	60%
42	200,684	1,730,722	862%	76	61%
43	165,512	1,532,567	926%	64	62%
44	135,492	1,338,463	988%	53	63%
45	110,117	1,154,563	1,048%	44	63%
46	88,895	989,526	1,113%	36	64%
47	71,274	842,013	1,181%	30	64%
48	56,755	716,273	1,262%	24	65%
49	44,901	603,777	1,345%	20	65%
50	35,316	502,125	1,422%	16	65%
51-55	88,808	1,429,581	1,610%	44	66%
56-60	24,321	475,651	1,956%	14	66%
61-65	6,563	136,605	2,081%	5	66%
66-70	887	16,223	1,829%	1	66%
Total	68,845,697	76,592,963	111%	20,686	66%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
1	12/26/2012	53	61	3-Year	90-Day	3% Compound	\$150	\$1,776	\$2,309	30.0%
2	1/18/2013	58	65	5-Year	90-Day	3% Compound	\$150	\$2,666	\$3,466	30.0%
3	1/24/2013	52	59	4-Year	90-Day	3% Compound	\$100	\$1,385	\$1,801	30.0%
4	2/27/2013	64	71	5-Year	90-Day	5% Compound	\$100	\$2,832	\$3,682	30.0%
5	2/27/2013	59	66	5-Year	90-Day	5% Compound	\$100	\$2,572	\$3,344	30.0%
6	2/28/2013	62	69	3-Year	90-Day	3% Compound	\$230	\$3,099	\$4,029	30.0%
7	2/28/2013	60	67	3-Year	90-Day	3% Compound	\$230	\$2,793	\$3,631	30.0%
8	3/1/2013	55	62	3-Year	90-Day	3% Compound	\$150	\$1,638	\$2,130	30.0%
9	3/1/2013	54	61	3-Year	90-Day	3% Compound	\$150	\$1,601	\$2,081	30.0%
10	3/1/2013	60	67	3-Year	90-Day	3% Compound	\$120	\$2,124	\$2,761	30.0%
11	3/2/2013	65	72	5-Year	90-Day	3% Compound	\$150	\$4,416	\$5,741	30.0%
12	3/16/2013	68	75	2-Year	90-Day	None	\$270	\$4,020	\$4,020	0.0%
13	3/18/2013	50	57	4-Year	180-Day	3% Compound	\$220	\$2,628	\$3,416	30.0%
14	3/26/2013	61	68	6-Year	90-Day	3% Compound	\$120	\$3,116	\$4,050	30.0%
15	4/6/2013	63	70	3-Year	90-Day	3% Compound	\$250	\$3,895	\$5,063	30.0%
16	4/8/2013	53	60	5-Year	90-Day	3% Compound	\$150	\$2,870	\$3,731	30.0%
17	4/9/2013	66	73	2-Year	90-Day	3% Compound	\$60	\$1,661	\$2,160	30.0%
18	4/11/2013	59	66	3-Year	90-Day	None	\$100	\$769	\$769	0.0%
19	4/12/2013	67	74	5-Year	90-Day	3% Compound	\$230	\$6,833	\$8,883	30.0%
20	4/15/2013	58	65	4-Year	90-Day	3% Compound	\$250	\$3,878	\$5,042	30.0%
21	4/15/2013	58	65	4-Year	90-Day	3% Compound	\$250	\$3,878	\$5,042	30.0%
22	4/22/2013	66	73	3-Year	90-Day	3% Compound	\$130	\$2,434	\$3,164	30.0%
23	4/30/2013	64	71	3-Year	90-Day	3% Compound	\$200	\$4,695	\$6,104	30.0%
24	4/30/2013	64	71	3-Year	90-Day	3% Compound	\$200	\$3,756	\$4,883	30.0%
25	5/2/2013	54	61	3-Year	90-Day	3% Compound	\$150	\$3,142	\$4,085	30.0%
26	5/3/2013	47	54	4-Year	90-Day	3% Compound	\$150	\$1,682	\$2,186	30.0%
27	5/3/2013	44	51	4-Year	90-Day	3% Compound	\$150	\$1,594	\$2,073	30.0%
28	5/9/2013	63	70	3-Year	90-Day	5% Compound	\$200	\$5,001	\$6,501	30.0%
29	5/9/2013	68	75	3-Year	90-Day	5% Compound	\$200	\$7,329	\$9,528	30.0%
30	5/17/2013	53	60	4-Year	90-Day	None	\$150	\$1,502	\$1,502	0.0%
31	5/20/2013	55	62	6-Year	90-Day	3% Compound	\$140	\$3,138	\$4,080	30.0%
32	5/23/2013	70	77	3-Year	180-Day	3% Compound	\$180	\$5,264	\$6,843	30.0%
33	6/1/2013	51	58	5-Year	90-Day	3% Compound	\$200	\$3,520	\$4,576	30.0%
34	6/1/2013	63	70	3-Year	90-Day	3% Compound	\$200	\$3,473	\$4,515	30.0%
35	6/5/2013	62	69	3-Year	90-Day	5% Compound	\$100	\$3,359	\$4,367	30.0%
36	6/10/2013	61	68	2-Year	90-Day	3% Compound	\$200	\$2,886	\$3,752	30.0%
37	6/25/2013	62	69	3-Year	90-Day	3% Compound	\$130	\$1,648	\$2,142	30.0%
38	6/25/2013	61	68	3-Year	90-Day	3% Compound	\$130	\$2,009	\$2,612	30.0%
39	7/5/2013	64	71	3-Year	90-Day	3% Compound	\$140	\$1,917	\$2,492	30.0%
40	7/5/2013	63	70	3-Year	90-Day	3% Compound	\$140	\$1,796	\$2,335	30.0%
41	7/9/2013	52	59	6-Year	90-Day	3% Compound	\$170	\$2,103	\$2,734	30.0%
42	7/20/2013	62	69	3-Year	90-Day	3% Compound	\$200	\$2,828	\$3,677	30.0%
43	7/20/2013	62	69	3-Year	90-Day	3% Compound	\$200	\$2,828	\$3,677	30.0%
44	7/24/2013	59	66	4-Year	180-Day	3% Compound	\$150	\$2,258	\$2,935	30.0%
45	7/24/2013	67	74	5-Year	90-Day	3% Compound	\$150	\$4,444	\$5,778	30.0%
46	7/30/2013	58	65	3-Year	180-Day	3% Compound	\$180	\$2,092	\$2,719	30.0%
47	8/1/2013	25	32	6-Year	90-Day	3% Compound	\$100	\$1,250	\$1,625	30.0%
48	8/1/2013	57	64	5-Year	90-Day	3% Compound	\$200	\$3,164	\$4,114	30.0%
49	8/4/2013	61	68	6-Year	90-Day	3% Compound	\$180	\$3,935	\$5,116	30.0%
50	8/7/2013	62	69	4-Year	90-Day	3% Compound	\$150	\$3,691	\$4,798	30.0%
51	8/14/2013	61	68	6-Year	90-Day	3% Compound	\$170	\$4,629	\$6,017	30.0%
52	8/19/2013	54	61	5-Year	90-Day	3% Compound	\$250	\$3,787	\$4,924	30.0%
53	8/19/2013	51	58	5-Year	90-Day	3% Compound	\$250	\$3,490	\$4,537	30.0%
54	8/19/2013	69	76	3-Year	90-Day	None	\$350	\$6,558	\$6,558	0.0%
55	8/19/2013	63	70	3-Year	90-Day	None	\$350	\$3,066	\$3,066	0.0%
56	8/21/2013	57	64	3-Year	90-Day	5% Compound	\$100	\$1,872	\$2,434	30.0%
57	8/21/2013	53	60	3-Year	90-Day	5% Compound	\$100	\$2,551	\$3,317	30.0%
58	8/23/2013	58	65	3-Year	90-Day	3% Compound	\$200	\$2,748	\$3,573	30.0%
59	8/23/2013	54	61	3-Year	90-Day	3% Compound	\$200	\$2,476	\$3,219	30.0%
60	9/3/2013	60	67	5-Year	90-Day	3% Compound	\$200	\$4,477	\$5,820	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
61	9/10/2013	45	52	5-Year	90-Day	3% Compound	\$250	\$3,711	\$4,824	30.0%
62	9/17/2013	49	56	6-Year	90-Day	3% Compound	\$250	\$3,423	\$4,450	30.0%
63	9/17/2013	46	53	6-Year	90-Day	3% Compound	\$250	\$3,045	\$3,958	30.0%
64	9/23/2013	58	65	5-Year	90-Day	3% Compound	\$150	\$2,400	\$3,120	30.0%
65	9/23/2013	58	65	5-Year	90-Day	3% Compound	\$150	\$2,187	\$2,844	30.0%
66	9/23/2013	58	65	5-Year	90-Day	3% Compound	\$150	\$2,303	\$2,993	30.0%
67	9/27/2013	58	65	3-Year	90-Day	3% Compound	\$100	\$1,185	\$1,541	30.0%
68	9/27/2013	58	65	3-Year	90-Day	3% Compound	\$100	\$1,067	\$1,387	30.0%
69	10/2/2013	70	77	4-Year	90-Day	3% Compound	\$250	\$8,931	\$11,610	30.0%
70	10/3/2013	66	73	4-Year	90-Day	3% Compound	\$200	\$4,849	\$6,304	30.0%
71	10/3/2013	55	62	6-Year	90-Day	3% Compound	\$150	\$2,202	\$2,863	30.0%
72	10/3/2013	52	59	6-Year	90-Day	3% Compound	\$150	\$1,763	\$2,292	30.0%
73	10/7/2013	58	65	4-Year	90-Day	3% Compound	\$240	\$3,392	\$4,410	30.0%
74	10/7/2013	61	68	4-Year	90-Day	3% Compound	\$240	\$3,933	\$5,112	30.0%
75	10/8/2013	63	70	4-Year	90-Day	3% Compound	\$200	\$4,084	\$5,309	30.0%
76	10/14/2013	53	60	6-Year	90-Day	3% Compound	\$150	\$3,026	\$3,934	30.0%
77	10/28/2013	60	67	5-Year	90-Day	3% Compound	\$150	\$2,817	\$3,662	30.0%
78	10/29/2013	58	65	2-Year	90-Day	3% Compound	\$250	\$2,194	\$2,852	30.0%
79	10/29/2013	58	65	2-Year	90-Day	3% Compound	\$250	\$2,438	\$3,169	30.0%
80	11/1/2013	55	62	5-Year	90-Day	3% Compound	\$170	\$2,767	\$3,597	30.0%
81	11/4/2013	53	60	4-Year	180-Day	3% Compound	\$200	\$2,209	\$2,871	30.0%
82	11/4/2013	61	68	3-Year	90-Day	3% Compound	\$150	\$1,762	\$2,291	30.0%
83	11/4/2013	54	61	3-Year	90-Day	3% Compound	\$150	\$2,002	\$2,603	30.0%
84	11/6/2013	63	70	3-Year	180-Day	3% Compound	\$180	\$3,005	\$3,907	30.0%
85	11/6/2013	64	71	3-Year	180-Day	3% Compound	\$180	\$2,706	\$3,518	30.0%
86	11/13/2013	58	65	6-Year	30-Day	3% Compound	\$200	\$5,526	\$7,183	30.0%
87	11/14/2013	57	64	3-Year	90-Day	None	\$300	\$2,038	\$2,038	0.0%
88	11/18/2013	52	59	5-Year	90-Day	3% Compound	\$150	\$1,950	\$2,535	30.0%
89	11/18/2013	65	72	5-Year	90-Day	None	\$100	\$1,659	\$1,659	0.0%
90	11/18/2013	55	62	5-Year	180-Day	None	\$150	\$993	\$993	0.0%
91	11/19/2013	64	71	5-Year	90-Day	3% Compound	\$150	\$4,041	\$5,253	30.0%
92	11/19/2013	57	64	4-Year	90-Day	3% Compound	\$150	\$2,864	\$3,723	30.0%
93	11/20/2013	60	67	5-Year	90-Day	3% Compound	\$130	\$2,196	\$2,855	30.0%
94	11/26/2013	66	73	3-Year	30-Day	3% Compound	\$130	\$3,375	\$4,387	30.0%
95	12/2/2013	58	65	3-Year	90-Day	3% Compound	\$200	\$2,925	\$3,802	30.0%
96	12/2/2013	58	65	3-Year	90-Day	3% Compound	\$200	\$2,925	\$3,802	30.0%
97	12/4/2013	24	31	2-Year	90-Day	3% Compound	\$60	\$453	\$589	30.0%
98	12/9/2013	58	65	4-Year	90-Day	3% Compound	\$200	\$3,323	\$4,319	30.0%
99	12/9/2013	59	66	4-Year	90-Day	3% Compound	\$200	\$4,307	\$5,599	30.0%
100	12/10/2013	60	67	6-Year	90-Day	3% Compound	\$130	\$3,645	\$4,738	30.0%
101	12/10/2013	63	70	5-Year	90-Day	3% Compound	\$180	\$4,989	\$6,486	30.0%
102	12/18/2013	60	67	6-Year	90-Day	None	\$250	\$4,183	\$4,183	0.0%
103	12/20/2013	50	57	3-Year	180-Day	3% Compound	\$200	\$2,257	\$2,934	30.0%
104	12/20/2013	71	78	2-Year	90-Day	None	\$120	\$2,297	\$2,297	0.0%
105	12/27/2013	71	78	6-Year	180-Day	3% Compound	\$160	\$6,417	\$8,343	30.0%
106	12/27/2013	66	73	6-Year	180-Day	3% Compound	\$160	\$3,617	\$4,702	30.0%
107	12/30/2013	65	72	2-Year	90-Day	5% Compound	\$100	\$3,041	\$3,954	30.0%
108	1/2/2014	62	68	3-Year	90-Day	3% Compound	\$150	\$3,407	\$4,429	30.0%
109	1/2/2014	60	66	3-Year	90-Day	3% Compound	\$150	\$2,586	\$3,362	30.0%
110	1/6/2014	58	64	5-Year	90-Day	3% Compound	\$200	\$3,689	\$4,796	30.0%
111	1/8/2014	63	69	5-Year	90-Day	3% Compound	\$200	\$3,692	\$4,800	30.0%
112	1/13/2014	57	63	5-Year	90-Day	None	\$400	\$3,066	\$3,066	0.0%
113	1/13/2014	56	62	5-Year	90-Day	None	\$400	\$2,942	\$2,942	0.0%
114	1/17/2014	62	68	3-Year	90-Day	None	\$150	\$1,538	\$1,538	0.0%
115	1/21/2014	68	74	3-Year	180-Day	3% Compound	\$200	\$3,740	\$4,861	30.0%
116	1/21/2014	60	66	6-Year	90-Day	3% Compound	\$300	\$5,893	\$7,661	30.0%
117	1/21/2014	60	66	6-Year	90-Day	3% Compound	\$300	\$6,548	\$8,513	30.0%
118	1/21/2014	62	68	3-Year	90-Day	3% Compound	\$180	\$2,401	\$3,122	30.0%
119	1/21/2014	61	67	3-Year	90-Day	3% Compound	\$180	\$2,928	\$3,806	30.0%
120	1/30/2014	60	66	6-Year	180-Day	3% Compound	\$300	\$8,500	\$11,050	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
121	2/4/2014	60	66	3-Year	90-Day	3% Compound	\$150	\$2,704	\$3,515	30.0%
122	2/4/2014	53	59	2-Year	90-Day	3% Compound	\$300	\$3,931	\$5,111	30.0%
123	2/4/2014	51	57	2-Year	90-Day	3% Compound	\$300	\$3,008	\$3,910	30.0%
124	2/13/2014	60	66	4-Year	90-Day	3% Compound	\$150	\$3,951	\$5,136	30.0%
125	2/18/2014	46	52	3-Year	90-Day	3% Compound	\$110	\$1,547	\$2,011	30.0%
126	2/21/2014	60	66	3-Year	90-Day	3% Compound	\$200	\$2,761	\$3,590	30.0%
127	2/21/2014	65	71	3-Year	90-Day	3% Compound	\$150	\$2,961	\$3,849	30.0%
128	2/24/2014	65	71	3-Year	90-Day	3% Compound	\$130	\$2,726	\$3,544	30.0%
129	2/24/2014	65	71	3-Year	90-Day	3% Compound	\$130	\$2,726	\$3,544	30.0%
130	3/5/2014	45	51	3-Year	90-Day	3% Compound	\$100	\$895	\$1,164	30.0%
131	3/5/2014	46	52	3-Year	90-Day	3% Compound	\$100	\$911	\$1,184	30.0%
132	3/10/2014	53	59	6-Year	90-Day	3% Compound	\$290	\$4,766	\$6,196	30.0%
133	3/14/2014	56	62	5-Year	90-Day	3% Compound	\$150	\$2,074	\$2,696	30.0%
134	3/14/2014	55	61	5-Year	90-Day	3% Compound	\$150	\$2,030	\$2,640	30.0%
135	3/17/2014	57	63	2-Year	90-Day	3% Compound	\$50	\$538	\$700	30.0%
136	3/18/2014	60	66	6-Year	90-Day	3% Compound	\$200	\$3,698	\$4,808	30.0%
137	3/19/2014	38	44	3-Year	90-Day	3% Compound	\$200	\$2,574	\$3,346	30.0%
138	4/3/2014	55	61	6-Year	90-Day	3% Compound	\$250	\$5,094	\$6,623	30.0%
139	4/3/2014	59	65	3-Year	90-Day	3% Compound	\$100	\$1,690	\$2,197	30.0%
140	4/3/2014	58	64	6-Year	90-Day	3% Compound	\$100	\$1,532	\$1,991	30.0%
141	4/4/2014	67	73	5-Year	90-Day	3% Compound	\$130	\$3,870	\$5,031	30.0%
142	4/4/2014	66	72	5-Year	90-Day	3% Compound	\$130	\$2,946	\$3,829	30.0%
143	4/7/2014	64	70	3-Year	90-Day	3% Compound	\$100	\$2,183	\$2,837	30.0%
144	4/9/2014	63	69	5-Year	90-Day	3% Compound	\$200	\$3,387	\$4,403	30.0%
145	4/9/2014	54	60	5-Year	90-Day	3% Compound	\$200	\$2,637	\$3,429	30.0%
146	4/13/2014	61	67	5-Year	90-Day	3% Compound	\$150	\$3,080	\$4,003	30.0%
147	4/16/2014	54	60	3-Year	90-Day	3% Compound	\$100	\$1,369	\$1,779	30.0%
148	4/29/2014	63	69	5-Year	90-Day	3% Compound	\$190	\$3,312	\$4,306	30.0%
149	5/2/2014	61	67	5-Year	180-Day	3% Compound	\$200	\$3,705	\$4,817	30.0%
150	5/12/2014	69	75	3-Year	90-Day	3% Compound	\$150	\$4,186	\$5,442	30.0%
151	5/12/2014	64	70	3-Year	90-Day	3% Compound	\$150	\$2,083	\$2,708	30.0%
152	5/12/2014	57	63	4-Year	90-Day	5% Compound	\$200	\$4,744	\$6,167	30.0%
153	5/12/2014	55	61	4-Year	90-Day	5% Compound	\$200	\$4,259	\$5,536	30.0%
154	5/17/2014	60	66	4-Year	90-Day	3% Compound	\$250	\$3,593	\$4,670	30.0%
155	5/17/2014	50	56	4-Year	90-Day	3% Compound	\$250	\$2,491	\$3,239	30.0%
156	5/21/2014	60	66	4-Year	90-Day	3% Compound	\$160	\$2,751	\$3,576	30.0%
157	5/21/2014	62	68	4-Year	90-Day	3% Compound	\$160	\$3,624	\$4,712	30.0%
158	5/22/2014	59	65	3-Year	90-Day	3% Compound	\$150	\$1,927	\$2,505	30.0%
159	5/22/2014	58	64	3-Year	90-Day	3% Compound	\$150	\$1,956	\$2,542	30.0%
160	5/28/2014	53	59	3-Year	90-Day	3% Compound	\$100	\$1,858	\$2,415	30.0%
161	5/29/2014	71	77	6-Year	90-Day	3% Compound	\$200	\$9,974	\$12,967	30.0%
162	6/3/2014	48	54	5-Year	180-Day	3% Compound	\$150	\$2,490	\$3,237	30.0%
163	6/6/2014	66	72	3-Year	90-Day	3% Compound	\$80	\$1,770	\$2,301	30.0%
164	6/6/2014	66	72	3-Year	90-Day	None	\$250	\$3,750	\$3,750	0.0%
165	6/12/2014	50	56	3-Year	90-Day	3% Compound	\$150	\$1,704	\$2,215	30.0%
166	6/20/2014	62	68	4-Year	90-Day	3% Compound	\$150	\$2,723	\$3,540	30.0%
167	6/20/2014	61	67	3-Year	90-Day	3% Compound	\$160	\$1,874	\$2,436	30.0%
168	6/20/2014	56	62	3-Year	90-Day	3% Compound	\$160	\$1,602	\$2,083	30.0%
169	6/26/2014	56	62	3-Year	90-Day	3% Compound	\$110	\$1,825	\$2,373	30.0%
170	6/30/2014	53	59	3-Year	90-Day	3% Compound	\$150	\$1,994	\$2,593	30.0%
171	7/2/2014	59	65	3-Year	90-Day	3% Compound	\$150	\$2,363	\$3,072	30.0%
172	7/3/2014	60	66	2-Year	90-Day	3% Compound	\$100	\$1,549	\$2,013	30.0%
173	7/6/2014	52	58	3-Year	90-Day	3% Compound	\$90	\$1,825	\$2,372	30.0%
174	7/8/2014	48	54	3-Year	90-Day	3% Compound	\$150	\$1,894	\$2,462	30.0%
175	7/9/2014	60	66	3-Year	90-Day	3% Compound	\$100	\$2,003	\$2,603	30.0%
176	7/9/2014	66	72	6-Year	90-Day	None	\$120	\$2,093	\$2,093	0.0%
177	7/9/2014	66	72	6-Year	90-Day	None	\$120	\$1,674	\$1,674	0.0%
178	7/10/2014	67	73	4-Year	90-Day	3% Compound	\$100	\$2,568	\$3,338	30.0%
179	7/10/2014	66	72	4-Year	90-Day	3% Compound	\$100	\$1,759	\$2,287	30.0%
180	7/11/2014	75	81	2-Year	90-Day	3% Compound	\$150	\$5,264	\$6,843	30.0%

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Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
181	7/12/2014	66	72	5-Year	90-Day	3% Compound	\$250	\$7,866	\$10,226	30.0%
182	7/21/2014	66	72	2-Year	90-Day	3% Compound	\$150	\$2,138	\$2,779	30.0%
183	7/21/2014	65	71	2-Year	90-Day	3% Compound	\$150	\$2,105	\$2,737	30.0%
184	7/23/2014	62	68	6-Year	90-Day	3% Compound	\$200	\$4,452	\$5,787	30.0%
185	7/24/2014	68	74	6-Year	90-Day	3% Compound	\$230	\$7,623	\$9,910	30.0%
186	7/28/2014	58	64	5-Year	90-Day	3% Compound	\$200	\$2,762	\$3,590	30.0%
187	7/28/2014	56	62	5-Year	90-Day	3% Compound	\$200	\$2,890	\$3,757	30.0%
188	8/1/2014	58	64	2-Year	90-Day	3% Compound	\$170	\$2,089	\$2,715	30.0%
189	8/1/2014	56	62	2-Year	90-Day	3% Compound	\$170	\$2,186	\$2,841	30.0%
190	8/1/2014	61	67	3-Year	90-Day	3% Compound	\$300	\$5,459	\$7,097	30.0%
191	8/4/2014	59	65	4-Year	90-Day	3% Compound	\$150	\$2,641	\$3,433	30.0%
192	8/4/2014	58	64	5-Year	90-Day	3% Compound	\$150	\$2,754	\$3,580	30.0%
193	8/6/2014	54	60	2-Year	90-Day	3% Compound	\$250	\$3,107	\$4,039	30.0%
194	8/11/2014	61	67	3-Year	90-Day	3% Compound	\$200	\$3,448	\$4,482	30.0%
195	8/22/2014	65	71	3-Year	180-Day	3% Compound	\$200	\$5,210	\$6,773	30.0%
196	8/22/2014	61	67	3-Year	180-Day	3% Compound	\$200	\$4,146	\$5,390	30.0%
197	8/27/2014	49	55	3-Year	90-Day	3% Compound	\$250	\$2,616	\$3,401	30.0%
198	8/28/2014	59	65	3-Year	90-Day	3% Compound	\$100	\$2,414	\$3,139	30.0%
199	9/4/2014	57	63	3-Year	90-Day	3% Compound	\$100	\$1,817	\$2,362	30.0%
200	9/6/2014	58	64	5-Year	90-Day	3% Compound	\$150	\$3,229	\$4,197	30.0%
201	9/8/2014	53	59	3-Year	90-Day	5% Compound	\$50	\$1,451	\$1,887	30.0%
202	9/15/2014	56	62	4-Year	90-Day	3% Compound	\$150	\$2,822	\$3,668	30.0%
203	9/16/2014	55	61	6-Year	90-Day	3% Compound	\$300	\$5,210	\$6,773	30.0%
204	9/25/2014	56	62	4-Year	90-Day	3% Compound	\$150	\$2,044	\$2,657	30.0%
205	9/29/2014	60	66	5-Year	90-Day	3% Compound	\$150	\$2,601	\$3,381	30.0%
206	9/29/2014	59	65	5-Year	90-Day	3% Compound	\$150	\$2,797	\$3,637	30.0%
207	10/1/2014	56	62	3-Year	90-Day	3% Compound	\$250	\$4,412	\$5,736	30.0%
208	10/7/2014	57	63	4-Year	90-Day	3% Compound	\$180	\$2,414	\$3,139	30.0%
209	10/7/2014	58	64	4-Year	90-Day	3% Compound	\$180	\$2,265	\$2,945	30.0%
210	10/10/2014	58	64	6-Year	90-Day	3% Compound	\$130	\$2,210	\$2,874	30.0%
211	10/13/2014	58	64	4-Year	90-Day	3% Compound	\$150	\$3,143	\$4,086	30.0%
212	10/14/2014	55	61	5-Year	90-Day	3% Compound	\$120	\$1,856	\$2,413	30.0%
213	10/15/2014	51	57	2-Year	90-Day	5% Compound	\$100	\$1,412	\$1,835	30.0%
214	10/15/2014	49	55	2-Year	90-Day	5% Compound	\$100	\$1,413	\$1,837	30.0%
215	10/17/2014	64	70	4-Year	180-Day	3% Compound	\$100	\$2,967	\$3,857	30.0%
216	10/22/2014	57	63	6-Year	90-Day	3% Compound	\$100	\$1,562	\$2,031	30.0%
217	10/22/2014	52	58	6-Year	90-Day	3% Compound	\$100	\$1,737	\$2,257	30.0%
218	10/23/2014	63	69	3-Year	90-Day	3% Compound	\$130	\$2,267	\$2,947	30.0%
219	10/23/2014	60	66	3-Year	90-Day	3% Compound	\$200	\$2,415	\$3,139	30.0%
220	10/23/2014	64	70	2-Year	90-Day	None	\$50	\$486	\$486	0.0%
221	10/24/2014	69	75	3-Year	90-Day	3% Compound	\$200	\$6,510	\$8,463	30.0%
222	10/24/2014	63	69	4-Year	90-Day	5% Compound	\$170	\$3,930	\$5,109	30.0%
223	10/24/2014	62	68	4-Year	90-Day	5% Compound	\$170	\$4,095	\$5,323	30.0%
224	11/1/2014	54	60	5-Year	90-Day	3% Compound	\$150	\$2,307	\$2,999	30.0%
225	11/3/2014	55	61	4-Year	90-Day	3% Compound	\$200	\$2,469	\$3,210	30.0%
226	11/3/2014	53	59	4-Year	90-Day	3% Compound	\$200	\$3,264	\$4,243	30.0%
227	11/7/2014	55	61	3-Year	90-Day	3% Compound	\$150	\$1,991	\$2,588	30.0%
228	11/15/2014	69	75	4-Year	90-Day	None	\$200	\$5,708	\$5,708	0.0%
229	11/17/2014	54	60	3-Year	90-Day	3% Compound	\$150	\$1,745	\$2,268	30.0%
230	11/20/2014	57	63	6-Year	90-Day	3% Compound	\$100	\$1,494	\$1,942	30.0%
231	11/20/2014	57	63	6-Year	90-Day	3% Compound	\$100	\$1,345	\$1,748	30.0%
232	11/21/2014	55	61	5-Year	90-Day	3% Compound	\$250	\$4,097	\$5,326	30.0%
233	12/2/2014	70	76	5-Year	180-Day	3% Compound	\$150	\$3,909	\$5,082	30.0%
234	12/2/2014	72	78	5-Year	180-Day	3% Compound	\$150	\$4,476	\$5,819	30.0%
235	12/4/2014	43	49	2-Year	90-Day	5% Compound	\$130	\$1,924	\$2,501	30.0%
236	12/4/2014	37	43	2-Year	90-Day	5% Compound	\$130	\$1,974	\$2,567	30.0%
237	12/6/2014	66	72	5-Year	90-Day	None	\$100	\$1,431	\$1,431	0.0%
238	12/6/2014	64	70	5-Year	90-Day	None	\$100	\$1,233	\$1,233	0.0%
239	12/6/2014	66	72	4-Year	90-Day	None	\$200	\$3,380	\$3,380	0.0%
240	12/13/2014	60	66	5-Year	90-Day	3% Compound	\$150	\$2,919	\$3,795	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
241	12/14/2014	57	63	6-Year	90-Day	3% Compound	\$200	\$2,530	\$3,289	30.0%
242	12/14/2014	55	61	6-Year	90-Day	3% Compound	\$200	\$3,377	\$4,390	30.0%
243	12/15/2014	58	64	6-Year	90-Day	3% Compound	\$130	\$2,456	\$3,193	30.0%
244	12/25/2014	54	60	3-Year	180-Day	3% Compound	\$100	\$1,201	\$1,562	30.0%
245	12/25/2014	55	61	3-Year	180-Day	3% Compound	\$100	\$984	\$1,279	30.0%
246	1/8/2015	63	68	5-Year	90-Day	3% Compound	\$150	\$3,313	\$4,306	30.0%
247	1/8/2015	57	62	5-Year	90-Day	3% Compound	\$150	\$2,092	\$2,719	30.0%
248	1/9/2015	60	65	4-Year	90-Day	3% Compound	\$170	\$4,436	\$5,767	30.0%
249	1/14/2015	59	64	4-Year	90-Day	3% Compound	\$150	\$2,080	\$2,704	30.0%
250	1/14/2015	62	67	4-Year	90-Day	3% Compound	\$150	\$2,265	\$2,944	30.0%
251	1/15/2015	49	54	6-Year	90-Day	3% Compound	\$250	\$3,788	\$4,924	30.0%
252	1/15/2015	47	52	6-Year	90-Day	3% Compound	\$250	\$4,552	\$5,918	30.0%
253	1/18/2015	67	72	3-Year	90-Day	None	\$250	\$4,786	\$4,786	0.0%
254	1/27/2015	61	66	3-Year	30-Day	3% Compound	\$100	\$2,053	\$2,669	30.0%
255	1/27/2015	62	67	5-Year	90-Day	3% Compound	\$100	\$2,005	\$2,606	30.0%
256	2/21/2015	59	64	3-Year	90-Day	3% Compound	\$100	\$1,910	\$2,482	30.0%
257	2/21/2015	55	60	6-Year	90-Day	5% Compound	\$100	\$3,420	\$4,446	30.0%
258	2/21/2015	56	61	6-Year	90-Day	5% Compound	\$100	\$2,470	\$3,211	30.0%
259	2/23/2015	59	64	6-Year	90-Day	3% Compound	\$250	\$4,612	\$5,996	30.0%
260	3/5/2015	57	62	5-Year	90-Day	3% Compound	\$200	\$3,590	\$4,667	30.0%
261	3/6/2015	57	62	6-Year	90-Day	3% Compound	\$150	\$2,985	\$3,880	30.0%
262	3/13/2015	59	64	2-Year	90-Day	3% Compound	\$150	\$1,672	\$2,173	30.0%
263	3/13/2015	57	62	2-Year	90-Day	3% Compound	\$150	\$1,933	\$2,513	30.0%
264	3/14/2015	60	65	6-Year	180-Day	None	\$150	\$1,605	\$1,605	0.0%
265	3/20/2015	54	59	3-Year	90-Day	3% Compound	\$150	\$2,256	\$2,933	30.0%
266	3/23/2015	64	69	2-Year	90-Day	3% Compound	\$150	\$2,099	\$2,729	30.0%
267	3/23/2015	62	67	2-Year	90-Day	3% Compound	\$150	\$1,820	\$2,366	30.0%
268	3/24/2015	62	67	4-Year	90-Day	3% Compound	\$200	\$3,834	\$4,984	30.0%
269	3/30/2015	55	60	3-Year	90-Day	3% Compound	\$150	\$2,830	\$3,679	30.0%
270	4/2/2015	62	67	5-Year	90-Day	None	\$300	\$3,304	\$3,304	0.0%
271	4/3/2015	62	67	3-Year	90-Day	3% Compound	\$220	\$4,222	\$5,489	30.0%
272	4/7/2015	62	67	5-Year	90-Day	3% Compound	\$150	\$3,881	\$5,046	30.0%
273	4/8/2015	55	60	4-Year	90-Day	3% Compound	\$200	\$2,578	\$3,352	30.0%
274	4/8/2015	59	64	4-Year	90-Day	3% Compound	\$200	\$2,610	\$3,393	30.0%
275	4/9/2015	58	63	2-Year	90-Day	3% Compound	\$250	\$4,095	\$5,323	30.0%
276	4/9/2015	52	57	3-Year	90-Day	None	\$160	\$1,085	\$1,085	0.0%
277	4/9/2015	56	61	6-Year	90-Day	None	\$330	\$2,570	\$2,570	0.0%
278	4/9/2015	56	61	6-Year	90-Day	None	\$330	\$2,570	\$2,570	0.0%
279	4/11/2015	69	74	3-Year	90-Day	3% Compound	\$180	\$5,365	\$6,974	30.0%
280	4/13/2015	64	69	2-Year	180-Day	3% Compound	\$200	\$2,861	\$3,719	30.0%
281	4/14/2015	60	65	3-Year	180-Day	3% Compound	\$240	\$3,918	\$5,093	30.0%
282	4/14/2015	53	58	5-Year	90-Day	5% Compound	\$200	\$6,120	\$7,956	30.0%
283	4/19/2015	66	71	3-Year	90-Day	None	\$220	\$3,631	\$3,631	0.0%
284	4/22/2015	57	62	6-Year	90-Day	3% Compound	\$150	\$2,319	\$3,015	30.0%
285	4/22/2015	54	59	6-Year	90-Day	3% Compound	\$150	\$2,178	\$2,831	30.0%
286	4/24/2015	57	62	3-Year	90-Day	3% Compound	\$250	\$3,793	\$4,931	30.0%
287	4/26/2015	65	70	2-Year	90-Day	3% Compound	\$230	\$3,489	\$4,536	30.0%
288	4/27/2015	60	65	6-Year	90-Day	5% Compound	\$200	\$5,880	\$7,644	30.0%
289	4/28/2015	61	66	6-Year	90-Day	None	\$130	\$2,403	\$2,403	0.0%
290	5/1/2015	60	65	3-Year	90-Day	3% Compound	\$150	\$2,557	\$3,323	30.0%
291	5/1/2015	59	64	3-Year	90-Day	3% Compound	\$150	\$2,475	\$3,218	30.0%
292	5/1/2015	60	65	3-Year	90-Day	3% Compound	\$150	\$2,432	\$3,162	30.0%
293	5/1/2015	61	66	3-Year	90-Day	3% Compound	\$150	\$2,779	\$3,612	30.0%
294	5/1/2015	62	67	3-Year	90-Day	3% Compound	\$150	\$2,187	\$2,843	30.0%
295	5/1/2015	64	69	3-Year	90-Day	3% Compound	\$150	\$2,786	\$3,622	30.0%
296	5/1/2015	62	67	3-Year	90-Day	3% Compound	\$150	\$2,695	\$3,503	30.0%
297	5/1/2015	48	53	6-Year	90-Day	5% Compound	\$100	\$2,845	\$3,698	30.0%
298	5/1/2015	58	63	3-Year	90-Day	3% Compound	\$150	\$1,772	\$2,304	30.0%
299	5/1/2015	56	61	3-Year	90-Day	3% Compound	\$150	\$1,669	\$2,170	30.0%
300	5/5/2015	61	66	3-Year	90-Day	3% Compound	\$150	\$2,626	\$3,413	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
301	5/13/2015	57	62	4-Year	90-Day	3% Compound	\$150	\$1,629	\$2,118	30.0%
302	5/13/2015	55	60	4-Year	90-Day	3% Compound	\$150	\$1,740	\$2,261	30.0%
303	5/15/2015	52	57	5-Year	90-Day	3% Compound	\$160	\$2,505	\$3,257	30.0%
304	5/15/2015	56	61	6-Year	90-Day	3% Compound	\$150	\$2,297	\$2,986	30.0%
305	5/15/2015	40	45	6-Year	90-Day	3% Compound	\$150	\$1,613	\$2,096	30.0%
306	5/27/2015	62	67	4-Year	90-Day	3% Compound	\$100	\$2,819	\$3,665	30.0%
307	6/3/2015	71	76	2-Year	90-Day	3% Compound	\$150	\$5,561	\$7,230	30.0%
308	6/3/2015	57	62	4-Year	90-Day	3% Compound	\$200	\$2,316	\$3,011	30.0%
309	6/3/2015	55	60	4-Year	90-Day	3% Compound	\$150	\$1,670	\$2,171	30.0%
310	6/12/2015	65	70	3-Year	90-Day	3% Compound	\$100	\$2,084	\$2,710	30.0%
311	6/23/2015	65	70	6-Year	90-Day	None	\$300	\$5,376	\$5,376	0.0%
312	6/23/2015	64	69	6-Year	90-Day	None	\$300	\$3,772	\$3,772	0.0%
313	6/23/2015	64	69	4-Year	90-Day	3% Compound	\$200	\$3,424	\$4,452	30.0%
314	6/23/2015	60	65	2-Year	90-Day	3% Compound	\$50	\$516	\$670	30.0%
315	6/24/2015	59	64	6-Year	90-Day	3% Compound	\$200	\$4,429	\$5,757	30.0%
316	6/24/2015	57	62	6-Year	90-Day	3% Compound	\$200	\$2,950	\$3,835	30.0%
317	6/26/2015	61	66	3-Year	90-Day	3% Compound	\$130	\$1,692	\$2,199	30.0%
318	6/26/2015	60	65	3-Year	90-Day	3% Compound	\$130	\$1,481	\$1,925	30.0%
319	6/29/2015	49	54	3-Year	90-Day	3% Compound	\$200	\$2,537	\$3,299	30.0%
320	6/29/2015	48	53	3-Year	90-Day	3% Compound	\$200	\$1,992	\$2,590	30.0%
321	6/30/2015	64	69	6-Year	90-Day	3% Compound	\$250	\$5,226	\$6,794	30.0%
322	6/30/2015	63	68	6-Year	90-Day	3% Compound	\$250	\$4,407	\$5,729	30.0%
323	7/6/2015	65	70	3-Year	90-Day	3% Compound	\$200	\$4,645	\$6,038	30.0%
324	7/17/2015	60	65	3-Year	90-Day	3% Compound	\$200	\$3,842	\$4,994	30.0%
325	7/18/2015	66	71	5-Year	90-Day	3% Compound	\$200	\$5,349	\$6,954	30.0%
326	7/21/2015	59	64	3-Year	30-Day	3% Compound	\$200	\$4,058	\$5,276	30.0%
327	7/22/2015	71	76	3-Year	90-Day	None	\$250	\$6,396	\$6,396	0.0%
328	7/22/2015	65	70	3-Year	90-Day	3% Compound	\$100	\$1,992	\$2,590	30.0%
329	7/22/2015	64	69	3-Year	90-Day	3% Compound	\$100	\$1,878	\$2,442	30.0%
330	7/31/2015	56	61	2-Year	90-Day	None	\$50	\$300	\$300	0.0%
331	8/3/2015	62	67	3-Year	180-Day	3% Compound	\$120	\$2,213	\$2,876	30.0%
332	8/5/2015	67	72	3-Year	90-Day	3% Compound	\$220	\$5,965	\$7,754	30.0%
333	8/5/2015	48	53	5-Year	90-Day	3% Compound	\$150	\$1,737	\$2,258	30.0%
334	8/5/2015	46	51	5-Year	180-Day	3% Compound	\$150	\$1,802	\$2,343	30.0%
335	8/6/2015	66	71	4-Year	90-Day	3% Compound	\$400	\$10,641	\$13,833	30.0%
336	8/6/2015	50	55	4-Year	90-Day	3% Compound	\$400	\$6,017	\$7,823	30.0%
337	8/10/2015	56	61	3-Year	90-Day	3% Compound	\$150	\$1,849	\$2,403	30.0%
338	8/10/2015	56	61	3-Year	90-Day	3% Compound	\$150	\$1,849	\$2,403	30.0%
339	8/11/2015	68	73	5-Year	90-Day	3% Compound	\$250	\$10,200	\$13,260	30.0%
340	8/13/2015	51	56	6-Year	90-Day	3% Compound	\$80	\$1,406	\$1,828	30.0%
341	8/14/2015	55	60	4-Year	90-Day	3% Compound	\$240	\$4,423	\$5,750	30.0%
342	8/16/2015	54	59	6-Year	90-Day	3% Compound	\$150	\$1,981	\$2,575	30.0%
343	8/16/2015	54	59	6-Year	90-Day	3% Compound	\$150	\$1,981	\$2,575	30.0%
344	8/18/2015	64	69	5-Year	90-Day	None	\$300	\$4,269	\$4,269	0.0%
345	8/20/2015	63	68	4-Year	90-Day	3% Compound	\$400	\$10,903	\$14,174	30.0%
346	9/1/2015	60	65	3-Year	90-Day	3% Compound	\$200	\$3,073	\$3,995	30.0%
347	9/13/2015	51	56	3-Year	90-Day	3% Compound	\$200	\$2,068	\$2,688	30.0%
348	9/13/2015	43	48	3-Year	90-Day	3% Compound	\$200	\$2,072	\$2,693	30.0%
349	9/17/2015	50	55	6-Year	90-Day	3% Compound	\$400	\$8,376	\$10,889	30.0%
350	9/21/2015	60	65	4-Year	90-Day	3% Compound	\$250	\$3,017	\$3,922	30.0%
351	9/21/2015	52	57	4-Year	90-Day	3% Compound	\$250	\$2,402	\$3,123	30.0%
352	9/22/2015	56	61	4-Year	90-Day	3% Compound	\$250	\$4,864	\$6,323	30.0%
353	9/23/2015	63	68	3-Year	90-Day	3% Compound	\$150	\$2,692	\$3,500	30.0%
354	9/23/2015	64	69	3-Year	90-Day	3% Compound	\$150	\$2,299	\$2,989	30.0%
355	9/23/2015	59	64	3-Year	90-Day	3% Compound	\$200	\$2,212	\$2,876	30.0%
356	9/23/2015	60	65	3-Year	90-Day	3% Compound	\$200	\$2,406	\$3,127	30.0%
357	9/25/2015	65	70	2-Year	90-Day	None	\$100	\$1,027	\$1,027	0.0%
358	9/26/2015	53	58	5-Year	90-Day	3% Compound	\$140	\$2,355	\$3,061	30.0%
359	9/30/2015	54	59	6-Year	90-Day	3% Compound	\$150	\$2,694	\$3,503	30.0%
360	9/30/2015	53	58	6-Year	90-Day	3% Compound	\$150	\$2,625	\$3,412	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
361	10/2/2015	51	56	5-Year	90-Day	3% Compound	\$250	\$3,372	\$4,383	30.0%
362	10/2/2015	51	56	5-Year	90-Day	3% Compound	\$250	\$3,034	\$3,945	30.0%
363	10/6/2015	55	60	6-Year	90-Day	3% Compound	\$200	\$3,811	\$4,954	30.0%
364	10/6/2015	65	70	5-Year	90-Day	None	\$230	\$3,694	\$3,694	0.0%
365	10/6/2015	52	57	4-Year	90-Day	3% Compound	\$100	\$1,073	\$1,395	30.0%
366	10/6/2015	52	57	4-Year	90-Day	3% Compound	\$100	\$966	\$1,255	30.0%
367	10/6/2015	63	68	3-Year	90-Day	3% Compound	\$200	\$3,462	\$4,501	30.0%
368	10/19/2015	33	38	6-Year	90-Day	None	\$160	\$640	\$640	0.0%
369	10/19/2015	37	42	6-Year	90-Day	None	\$160	\$711	\$711	0.0%
370	10/20/2015	61	66	5-Year	90-Day	3% Compound	\$200	\$4,302	\$5,593	30.0%
371	11/2/2015	61	66	4-Year	90-Day	3% Compound	\$130	\$3,538	\$4,599	30.0%
372	11/3/2015	41	46	3-Year	90-Day	3% Compound	\$200	\$2,355	\$3,061	30.0%
373	11/9/2015	68	73	6-Year	90-Day	3% Compound	\$200	\$4,338	\$5,640	30.0%
374	11/9/2015	66	71	6-Year	90-Day	3% Compound	\$200	\$3,894	\$5,063	30.0%
375	11/10/2015	52	57	3-Year	90-Day	3% Compound	\$150	\$1,853	\$2,408	30.0%
376	11/10/2015	52	57	3-Year	90-Day	3% Compound	\$150	\$1,667	\$2,168	30.0%
377	11/18/2015	65	70	6-Year	90-Day	None	\$350	\$6,322	\$6,322	0.0%
378	11/19/2015	62	67	3-Year	90-Day	3% Compound	\$100	\$1,711	\$2,224	30.0%
379	11/20/2015	66	71	6-Year	90-Day	3% Compound	\$250	\$5,550	\$7,215	30.0%
380	11/20/2015	61	66	6-Year	90-Day	3% Compound	\$250	\$3,794	\$4,932	30.0%
381	11/30/2015	42	47	6-Year	90-Day	5% Compound	\$100	\$3,004	\$3,905	30.0%
382	12/1/2015	57	62	3-Year	90-Day	3% Compound	\$200	\$3,356	\$4,363	30.0%
383	12/1/2015	62	67	5-Year	90-Day	3% Compound	\$200	\$3,436	\$4,467	30.0%
384	12/1/2015	61	66	5-Year	90-Day	3% Compound	\$200	\$4,656	\$6,052	30.0%
385	12/2/2015	72	77	3-Year	90-Day	3% Compound	\$150	\$5,498	\$7,147	30.0%
386	12/4/2015	57	62	3-Year	90-Day	3% Compound	\$200	\$3,870	\$5,031	30.0%
387	12/4/2015	53	58	3-Year	90-Day	3% Compound	\$200	\$2,833	\$3,682	30.0%
388	12/10/2015	58	63	2-Year	90-Day	3% Compound	\$170	\$1,818	\$2,364	30.0%
389	12/10/2015	65	70	3-Year	90-Day	3% Compound	\$170	\$3,061	\$3,979	30.0%
390	12/16/2015	52	57	6-Year	90-Day	3% Compound	\$300	\$5,303	\$6,893	30.0%
391	12/17/2015	63	68	4-Year	90-Day	3% Compound	\$200	\$4,598	\$5,977	30.0%
392	12/23/2015	67	72	3-Year	90-Day	None	\$280	\$3,308	\$3,308	0.0%
393	12/28/2015	40	45	3-Year	90-Day	None	\$110	\$383	\$383	0.0%
394	12/28/2015	40	45	3-Year	90-Day	None	\$110	\$383	\$383	0.0%
395	1/7/2016	61	65	3-Year	90-Day	3% Compound	\$200	\$3,276	\$4,259	30.0%
396	1/7/2016	60	64	3-Year	90-Day	3% Compound	\$200	\$2,549	\$3,313	30.0%
397	1/12/2016	68	72	4-Year	60-Day	3% Compound	\$120	\$4,466	\$5,805	30.0%
398	1/13/2016	57	61	3-Year	90-Day	3% Compound	\$100	\$1,250	\$1,625	30.0%
399	1/13/2016	57	61	3-Year	90-Day	3% Compound	\$100	\$1,316	\$1,711	30.0%
400	1/18/2016	52	56	3-Year	90-Day	3% Compound	\$150	\$2,129	\$2,768	30.0%
401	1/22/2016	63	67	3-Year	90-Day	3% Compound	\$200	\$3,308	\$4,301	30.0%
402	1/22/2016	63	67	3-Year	90-Day	3% Compound	\$200	\$3,308	\$4,301	30.0%
403	1/26/2016	65	69	5-Year	90-Day	3% Compound	\$180	\$4,372	\$5,683	30.0%
404	2/1/2016	67	71	3-Year	90-Day	None	\$280	\$3,308	\$3,308	0.0%
405	2/3/2016	61	65	3-Year	90-Day	3% Compound	\$200	\$2,869	\$3,730	30.0%
406	2/3/2016	59	63	3-Year	90-Day	3% Compound	\$200	\$2,701	\$3,512	30.0%
407	2/25/2016	57	61	3-Year	90-Day	3% Compound	\$150	\$2,424	\$3,151	30.0%
408	3/1/2016	58	62	5-Year	90-Day	3% Compound	\$150	\$2,383	\$3,098	30.0%
409	3/4/2016	74	78	3-Year	90-Day	3% Compound	\$150	\$7,226	\$9,394	30.0%
410	3/15/2016	65	69	2-Year	90-Day	3% Compound	\$150	\$3,206	\$4,168	30.0%
411	3/15/2016	55	59	6-Year	90-Day	5% Compound	\$400	\$11,252	\$14,628	30.0%
412	3/15/2016	59	63	3-Year	90-Day	3% Compound	\$100	\$1,502	\$1,953	30.0%
413	3/15/2016	54	58	3-Year	90-Day	3% Compound	\$100	\$1,305	\$1,697	30.0%
414	3/18/2016	58	62	4-Year	90-Day	5% Compound	\$170	\$6,695	\$8,703	30.0%
415	3/18/2016	65	69	4-Year	90-Day	3% Compound	\$200	\$3,743	\$4,866	30.0%
416	3/18/2016	60	64	4-Year	90-Day	3% Compound	\$200	\$3,219	\$4,185	30.0%
417	3/21/2016	59	63	4-Year	90-Day	3% Compound	\$130	\$2,059	\$2,677	30.0%
418	3/28/2016	59	63	3-Year	90-Day	3% Compound	\$130	\$1,681	\$2,185	30.0%
419	3/28/2016	61	65	3-Year	90-Day	3% Compound	\$130	\$1,607	\$2,089	30.0%
420	3/31/2016	45	49	5-Year	90-Day	3% Compound	\$150	\$1,476	\$1,919	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
421	3/31/2016	44	48	5-Year	90-Day	3% Compound	\$150	\$1,449	\$1,884	30.0%
422	3/31/2016	50	54	4-Year	90-Day	3% Compound	\$100	\$1,609	\$2,091	30.0%
423	4/5/2016	36	40	3-Year	90-Day	3% Compound	\$270	\$3,836	\$4,986	30.0%
424	4/6/2016	56	60	6-Year	90-Day	3% Compound	\$140	\$2,993	\$3,891	30.0%
425	4/14/2016	52	56	3-Year	90-Day	5% Compound	\$120	\$2,102	\$2,733	30.0%
426	4/14/2016	51	55	3-Year	90-Day	5% Compound	\$120	\$2,109	\$2,741	30.0%
427	4/19/2016	62	66	3-Year	90-Day	3% Compound	\$230	\$4,901	\$6,371	30.0%
428	4/23/2016	54	58	5-Year	90-Day	5% Compound	\$100	\$2,411	\$3,134	30.0%
429	4/23/2016	55	59	5-Year	90-Day	5% Compound	\$100	\$2,426	\$3,154	30.0%
430	4/26/2016	61	65	3-Year	90-Day	3% Compound	\$220	\$3,633	\$4,723	30.0%
431	4/28/2016	63	67	2-Year	90-Day	3% Compound	\$100	\$1,881	\$2,445	30.0%
432	5/2/2016	60	64	5-Year	180-Day	3% Compound	\$200	\$4,228	\$5,496	30.0%
433	6/6/2016	65	69	5-Year	180-Day	3% Compound	\$120	\$2,700	\$3,510	30.0%
434	6/6/2016	64	68	5-Year	180-Day	3% Compound	\$120	\$2,036	\$2,647	30.0%
435	6/7/2016	65	69	4-Year	90-Day	None	\$210	\$3,575	\$3,575	0.0%
436	6/9/2016	66	70	3-Year	90-Day	3% Compound	\$150	\$2,828	\$3,676	30.0%
437	6/14/2016	61	65	3-Year	90-Day	3% Compound	\$170	\$3,538	\$4,599	30.0%
438	6/20/2016	62	66	5-Year	180-Day	3% Compound	\$150	\$3,008	\$3,911	30.0%
439	6/21/2016	62	66	6-Year	90-Day	3% Compound	\$250	\$5,458	\$7,095	30.0%
440	7/2/2016	64	68	5-Year	90-Day	3% Compound	\$150	\$2,848	\$3,703	30.0%
441	7/5/2016	59	63	5-Year	90-Day	3% Compound	\$170	\$3,305	\$4,297	30.0%
442	7/6/2016	46	50	2-Year	90-Day	3% Compound	\$300	\$3,413	\$4,438	30.0%
443	7/6/2016	46	50	2-Year	90-Day	3% Compound	\$300	\$3,413	\$4,438	30.0%
444	7/6/2016	54	58	3-Year	180-Day	3% Compound	\$250	\$2,048	\$2,662	30.0%
445	7/6/2016	46	50	3-Year	180-Day	3% Compound	\$250	\$1,934	\$2,514	30.0%
446	7/6/2016	49	53	6-Year	90-Day	None	\$400	\$2,135	\$2,135	0.0%
447	7/6/2016	49	53	6-Year	90-Day	None	\$400	\$2,372	\$2,372	0.0%
448	7/7/2016	62	66	5-Year	90-Day	3% Compound	\$170	\$4,399	\$5,718	30.0%
449	7/8/2016	68	72	6-Year	90-Day	3% Compound	\$200	\$7,533	\$9,793	30.0%
450	7/25/2016	40	44	5-Year	90-Day	3% Compound	\$160	\$1,384	\$1,799	30.0%
451	7/25/2016	49	53	5-Year	90-Day	3% Compound	\$160	\$1,612	\$2,095	30.0%
452	7/25/2016	68	72	3-Year	90-Day	3% Compound	\$130	\$3,716	\$4,831	30.0%
453	7/26/2016	49	53	4-Year	90-Day	3% Compound	\$150	\$2,374	\$3,086	30.0%
454	7/28/2016	56	60	2-Year	90-Day	3% Compound	\$140	\$1,548	\$2,012	30.0%
455	7/28/2016	56	60	2-Year	90-Day	3% Compound	\$140	\$1,548	\$2,012	30.0%
456	8/1/2016	64	68	6-Year	30-Day	5% Compound	\$130	\$8,378	\$10,891	30.0%
457	8/1/2016	52	56	5-Year	90-Day	3% Compound	\$150	\$2,272	\$2,953	30.0%
458	8/15/2016	54	58	3-Year	90-Day	3% Compound	\$200	\$2,737	\$3,558	30.0%
459	8/17/2016	73	77	2-Year	90-Day	None	\$150	\$4,106	\$4,106	0.0%
460	8/17/2016	62	66	3-Year	90-Day	3% Compound	\$200	\$3,731	\$4,850	30.0%
461	8/23/2016	65	69	3-Year	90-Day	3% Compound	\$120	\$2,228	\$2,896	30.0%
462	8/26/2016	60	64	4-Year	90-Day	None	\$300	\$4,707	\$4,707	0.0%
463	9/2/2016	68	72	4-Year	90-Day	3% Compound	\$120	\$5,094	\$6,622	30.0%
464	9/3/2016	48	52	3-Year	90-Day	3% Compound	\$140	\$1,296	\$1,684	30.0%
465	9/3/2016	49	53	3-Year	90-Day	3% Compound	\$140	\$1,467	\$1,907	30.0%
466	9/9/2016	64	68	3-Year	90-Day	3% Compound	\$250	\$3,276	\$4,259	30.0%
467	9/9/2016	61	65	3-Year	90-Day	3% Compound	\$250	\$2,928	\$3,806	30.0%
468	9/15/2016	65	69	4-Year	90-Day	None	\$200	\$3,143	\$3,143	0.0%
469	9/20/2016	62	66	3-Year	90-Day	None	\$250	\$1,739	\$1,739	0.0%
470	9/20/2016	62	66	3-Year	90-Day	None	\$250	\$1,739	\$1,739	0.0%
471	9/21/2016	41	45	5-Year	90-Day	3% Compound	\$120	\$944	\$1,227	30.0%
472	9/21/2016	40	44	5-Year	90-Day	3% Compound	\$120	\$934	\$1,214	30.0%
473	9/26/2016	53	57	6-Year	180-Day	5% Compound	\$160	\$5,417	\$7,042	30.0%
474	10/4/2016	56	60	4-Year	90-Day	None	\$300	\$2,584	\$2,584	0.0%
475	10/11/2016	62	66	4-Year	90-Day	3% Compound	\$140	\$3,444	\$4,478	30.0%
476	10/12/2016	57	61	3-Year	90-Day	5% Compound	\$120	\$2,172	\$2,823	30.0%
477	10/12/2016	56	60	3-Year	90-Day	5% Compound	\$120	\$2,173	\$2,825	30.0%
478	10/14/2016	47	51	6-Year	180-Day	None	\$400	\$2,214	\$2,214	0.0%
479	10/29/2016	64	68	3-Year	90-Day	3% Compound	\$140	\$2,100	\$2,729	30.0%
480	10/29/2016	62	66	3-Year	90-Day	3% Compound	\$140	\$1,821	\$2,367	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
481	10/31/2016	68	72	4-Year	90-Day	3% Compound	\$150	\$4,501	\$5,852	30.0%
482	11/3/2016	53	57	4-Year	90-Day	3% Compound	\$170	\$1,778	\$2,311	30.0%
483	11/3/2016	52	56	4-Year	90-Day	3% Compound	\$170	\$1,920	\$2,496	30.0%
484	11/9/2016	67	71	5-Year	90-Day	None	\$250	\$4,956	\$4,956	0.0%
485	11/9/2016	68	72	5-Year	90-Day	None	\$250	\$4,498	\$4,498	0.0%
486	11/11/2016	53	57	4-Year	90-Day	3% Compound	\$150	\$1,841	\$2,393	30.0%
487	11/11/2016	53	57	4-Year	90-Day	3% Compound	\$150	\$1,657	\$2,154	30.0%
488	11/16/2016	63	67	5-Year	90-Day	3% Compound	\$120	\$2,205	\$2,866	30.0%
489	11/16/2016	60	64	5-Year	90-Day	3% Compound	\$120	\$1,868	\$2,429	30.0%
490	11/22/2016	61	65	5-Year	180-Day	3% Compound	\$150	\$1,738	\$2,260	30.0%
491	11/23/2016	58	62	3-Year	90-Day	5% Compound	\$100	\$2,107	\$2,739	30.0%
492	11/28/2016	66	70	5-Year	90-Day	3% Compound	\$100	\$2,108	\$2,740	30.0%
493	11/28/2016	59	63	5-Year	90-Day	3% Compound	\$100	\$1,507	\$1,960	30.0%
494	11/30/2016	53	57	5-Year	90-Day	3% Compound	\$150	\$2,273	\$2,955	30.0%
495	12/12/2016	56	60	6-Year	90-Day	3% Compound	\$200	\$3,539	\$4,600	30.0%
496	12/12/2016	54	58	5-Year	90-Day	3% Compound	\$150	\$2,385	\$3,101	30.0%
497	12/14/2016	57	61	3-Year	90-Day	3% Compound	\$150	\$1,802	\$2,343	30.0%
498	12/14/2016	51	55	3-Year	90-Day	3% Compound	\$150	\$1,487	\$1,934	30.0%
499	12/19/2016	53	57	3-Year	90-Day	3% Compound	\$170	\$1,831	\$2,380	30.0%
500	12/19/2016	46	50	4-Year	90-Day	3% Compound	\$250	\$4,390	\$5,707	30.0%
501	1/1/2017	64	67	3-Year	90-Day	3% Compound	\$150	\$2,948	\$3,832	30.0%
502	1/2/2017	65	68	3-Year	90-Day	3% Compound	\$250	\$3,924	\$5,101	30.0%
503	1/2/2017	61	64	3-Year	90-Day	3% Compound	\$250	\$2,811	\$3,654	30.0%
504	1/3/2017	54	57	3-Year	90-Day	3% Compound	\$200	\$2,029	\$2,637	30.0%
505	1/3/2017	54	57	3-Year	90-Day	3% Compound	\$200	\$2,373	\$3,085	30.0%
506	1/4/2017	63	66	5-Year	90-Day	None	\$250	\$2,816	\$2,816	0.0%
507	1/4/2017	63	66	5-Year	90-Day	None	\$250	\$2,816	\$2,816	0.0%
508	1/12/2017	63	66	3-Year	90-Day	3% Compound	\$250	\$3,453	\$4,489	30.0%
509	1/12/2017	64	67	3-Year	90-Day	3% Compound	\$250	\$3,692	\$4,800	30.0%
510	1/20/2017	56	59	3-Year	90-Day	3% Compound	\$150	\$2,656	\$3,453	30.0%
511	1/23/2017	61	64	3-Year	90-Day	3% Compound	\$150	\$2,385	\$3,100	30.0%
512	1/23/2017	59	62	3-Year	90-Day	3% Compound	\$150	\$2,610	\$3,393	30.0%
513	1/30/2017	59	62	3-Year	90-Day	5% Compound	\$120	\$2,484	\$3,229	30.0%
514	2/2/2017	60	63	5-Year	90-Day	3% Compound	\$160	\$4,449	\$5,783	30.0%
515	2/8/2017	54	57	2-Year	90-Day	3% Compound	\$140	\$2,400	\$3,120	30.0%
516	2/10/2017	56	59	3-Year	90-Day	3% Compound	\$150	\$2,842	\$3,695	30.0%
517	2/10/2017	55	58	3-Year	90-Day	3% Compound	\$150	\$2,782	\$3,617	30.0%
518	2/14/2017	61	64	3-Year	90-Day	3% Compound	\$200	\$3,160	\$4,109	30.0%
519	2/24/2017	61	64	4-Year	90-Day	3% Compound	\$150	\$3,462	\$4,500	30.0%
520	3/6/2017	57	60	3-Year	90-Day	3% Compound	\$150	\$2,049	\$2,664	30.0%
521	3/7/2017	57	60	3-Year	90-Day	3% Compound	\$200	\$2,924	\$3,801	30.0%
522	3/7/2017	71	74	3-Year	90-Day	3% Compound	\$200	\$5,943	\$7,726	30.0%
523	3/13/2017	51	54	5-Year	180-Day	3% Compound	\$150	\$2,247	\$2,921	30.0%
524	3/14/2017	63	66	3-Year	90-Day	None	\$250	\$4,021	\$4,021	0.0%
525	3/15/2017	52	55	6-Year	180-Day	3% Compound	\$150	\$1,534	\$1,994	30.0%
526	3/15/2017	53	56	6-Year	180-Day	3% Compound	\$150	\$1,578	\$2,051	30.0%
527	3/21/2017	60	63	3-Year	180-Day	3% Compound	\$170	\$2,971	\$3,863	30.0%
528	3/24/2017	54	57	4-Year	90-Day	3% Compound	\$150	\$1,922	\$2,498	30.0%
529	3/24/2017	50	53	4-Year	90-Day	3% Compound	\$150	\$1,761	\$2,289	30.0%
530	3/27/2017	55	58	5-Year	90-Day	3% Compound	\$100	\$1,633	\$2,123	30.0%
531	4/10/2017	56	59	5-Year	90-Day	3% Compound	\$170	\$3,325	\$4,322	30.0%
532	4/18/2017	61	64	3-Year	90-Day	3% Compound	\$200	\$3,160	\$4,109	30.0%
533	4/25/2017	61	64	4-Year	90-Day	3% Compound	\$130	\$2,700	\$3,510	30.0%
534	4/27/2017	43	46	4-Year	90-Day	3% Compound	\$150	\$3,422	\$4,449	30.0%
535	5/1/2017	60	63	3-Year	90-Day	3% Compound	\$250	\$3,796	\$4,935	30.0%
536	5/1/2017	59	62	3-Year	90-Day	3% Compound	\$250	\$2,940	\$3,822	30.0%
537	5/3/2017	58	61	3-Year	60-Day	3% Compound	\$110	\$1,287	\$1,673	30.0%
538	5/3/2017	56	59	3-Year	60-Day	3% Compound	\$110	\$1,346	\$1,750	30.0%
539	5/11/2017	60	63	6-Year	180-Day	3% Compound	\$150	\$2,034	\$2,644	30.0%
540	5/11/2017	59	62	6-Year	180-Day	3% Compound	\$150	\$2,187	\$2,844	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
541	5/18/2017	61	64	4-Year	90-Day	None	\$100	\$1,191	\$1,191	0.0%
542	5/18/2017	60	63	4-Year	90-Day	None	\$100	\$1,123	\$1,123	0.0%
543	5/22/2017	58	61	6-Year	90-Day	3% Compound	\$160	\$2,996	\$3,895	30.0%
544	5/23/2017	58	61	5-Year	90-Day	3% Compound	\$170	\$2,852	\$3,708	30.0%
545	5/24/2017	58	61	3-Year	90-Day	3% Compound	\$120	\$1,722	\$2,238	30.0%
546	5/25/2017	51	54	6-Year	180-Day	3% Compound	\$150	\$2,017	\$2,622	30.0%
547	5/26/2017	64	67	3-Year	90-Day	3% Compound	\$170	\$3,988	\$5,185	30.0%
548	5/28/2017	65	68	3-Year	90-Day	None	\$80	\$1,425	\$1,425	0.0%
549	5/30/2017	65	68	3-Year	90-Day	3% Compound	\$250	\$4,935	\$6,415	30.0%
550	6/7/2017	64	67	3-Year	90-Day	3% Compound	\$120	\$3,284	\$4,269	30.0%
551	6/13/2017	60	63	3-Year	90-Day	3% Compound	\$120	\$2,824	\$3,671	30.0%
552	6/14/2017	44	47	5-Year	90-Day	3% Compound	\$250	\$3,051	\$3,966	30.0%
553	6/15/2017	60	63	4-Year	90-Day	3% Compound	\$150	\$2,455	\$3,192	30.0%
554	6/21/2017	59	62	3-Year	90-Day	3% Compound	\$200	\$3,150	\$4,096	30.0%
555	6/22/2017	46	49	6-Year	90-Day	5% Compound	\$100	\$3,280	\$4,265	30.0%
556	6/22/2017	45	48	6-Year	90-Day	5% Compound	\$100	\$2,361	\$3,089	30.0%
557	6/23/2017	56	59	4-Year	90-Day	3% Compound	\$100	\$1,762	\$2,291	30.0%
558	6/23/2017	42	45	3-Year	90-Day	3% Compound	\$250	\$2,103	\$2,734	30.0%
559	6/23/2017	42	45	3-Year	90-Day	3% Compound	\$250	\$2,103	\$2,734	30.0%
560	7/1/2017	54	57	3-Year	90-Day	3% Compound	\$150	\$2,047	\$2,662	30.0%
561	7/12/2017	53	56	3-Year	90-Day	3% Compound	\$100	\$1,300	\$1,690	30.0%
562	7/12/2017	54	57	3-Year	90-Day	3% Compound	\$100	\$1,068	\$1,388	30.0%
563	7/18/2017	63	66	4-Year	90-Day	3% Compound	\$150	\$3,810	\$4,954	30.0%
564	7/21/2017	52	55	6-Year	90-Day	3% Compound	\$170	\$2,656	\$3,452	30.0%
565	7/21/2017	57	60	6-Year	90-Day	3% Compound	\$170	\$2,389	\$3,106	30.0%
566	7/28/2017	62	65	3-Year	180-Day	3% Compound	\$260	\$3,922	\$5,098	30.0%
567	8/1/2017	58	61	6-Year	180-Day	3% Compound	\$150	\$2,366	\$3,076	30.0%
568	8/11/2017	52	55	3-Year	90-Day	3% Compound	\$100	\$1,604	\$2,085	30.0%
569	8/16/2017	52	55	6-Year	90-Day	3% Compound	\$150	\$2,269	\$2,950	30.0%
570	8/17/2017	56	59	4-Year	90-Day	3% Compound	\$100	\$1,938	\$2,520	30.0%
571	8/21/2017	56	59	4-Year	90-Day	3% Compound	\$150	\$2,126	\$2,764	30.0%
572	8/22/2017	62	65	4-Year	90-Day	3% Compound	\$230	\$4,872	\$6,333	30.0%
573	8/30/2017	62	65	4-Year	90-Day	None	\$200	\$1,686	\$1,686	0.0%
574	8/30/2017	60	63	4-Year	90-Day	None	\$200	\$1,362	\$1,362	0.0%
575	9/5/2017	57	60	3-Year	90-Day	3% Compound	\$120	\$1,668	\$2,168	30.0%
576	9/5/2017	56	59	3-Year	90-Day	3% Compound	\$120	\$1,637	\$2,128	30.0%
577	9/7/2017	56	59	4-Year	90-Day	3% Compound	\$150	\$2,083	\$2,708	30.0%
578	9/7/2017	63	66	4-Year	90-Day	3% Compound	\$150	\$2,693	\$3,501	30.0%
579	9/26/2017	60	63	3-Year	90-Day	3% Compound	\$100	\$1,889	\$2,456	30.0%
580	9/27/2017	58	61	2-Year	90-Day	5% Compound	\$50	\$1,260	\$1,638	30.0%
581	9/27/2017	59	62	2-Year	90-Day	5% Compound	\$150	\$2,777	\$3,610	30.0%
582	10/1/2017	57	60	3-Year	90-Day	5% Compound	\$150	\$4,236	\$5,507	30.0%
583	10/1/2017	47	50	6-Year	90-Day	None	\$300	\$1,953	\$1,953	0.0%
584	10/3/2017	63	66	6-Year	90-Day	3% Compound	\$170	\$4,552	\$5,918	30.0%
585	10/15/2017	46	49	6-Year	90-Day	3% Compound	\$200	\$2,585	\$3,360	30.0%
586	10/15/2017	51	54	6-Year	90-Day	3% Compound	\$200	\$2,550	\$3,314	30.0%
587	10/18/2017	62	65	4-Year	90-Day	None	\$160	\$1,756	\$1,756	0.0%
588	10/18/2017	62	65	4-Year	90-Day	None	\$160	\$1,580	\$1,580	0.0%
589	10/20/2017	55	58	6-Year	180-Day	3% Compound	\$140	\$1,815	\$2,360	30.0%
590	10/20/2017	53	56	6-Year	180-Day	3% Compound	\$140	\$1,637	\$2,128	30.0%
591	10/20/2017	52	55	6-Year	90-Day	3% Compound	\$180	\$2,501	\$3,251	30.0%
592	10/20/2017	52	55	6-Year	90-Day	3% Compound	\$50	\$660	\$858	30.0%
593	11/1/2017	61	64	3-Year	90-Day	5% Compound	\$120	\$3,211	\$4,174	30.0%
594	11/1/2017	61	64	3-Year	90-Day	5% Compound	\$120	\$2,569	\$3,339	30.0%
595	11/7/2017	54	57	3-Year	90-Day	3% Compound	\$150	\$1,506	\$1,958	30.0%
596	11/7/2017	54	57	3-Year	90-Day	3% Compound	\$150	\$1,749	\$2,274	30.0%
597	11/7/2017	62	65	4-Year	90-Day	3% Compound	\$250	\$4,184	\$5,439	30.0%
598	11/7/2017	60	63	4-Year	90-Day	3% Compound	\$250	\$3,969	\$5,159	30.0%
599	11/9/2017	50	53	3-Year	90-Day	3% Compound	\$200	\$1,957	\$2,544	30.0%
600	11/9/2017	52	55	3-Year	90-Day	3% Compound	\$200	\$2,022	\$2,629	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
601	11/9/2017	58	61	3-Year	90-Day	5% Compound	\$120	\$2,435	\$3,166	30.0%
602	11/9/2017	57	60	6-Year	90-Day	3% Compound	\$140	\$3,409	\$4,431	30.0%
603	11/10/2017	57	60	5-Year	90-Day	3% Compound	\$150	\$2,186	\$2,842	30.0%
604	11/15/2017	59	62	4-Year	180-Day	3% Compound	\$200	\$3,768	\$4,898	30.0%
605	11/30/2017	67	70	5-Year	90-Day	3% Compound	\$300	\$6,766	\$8,796	30.0%
606	11/30/2017	66	69	5-Year	90-Day	3% Compound	\$350	\$7,510	\$9,763	30.0%
607	12/1/2017	59	62	3-Year	90-Day	3% Compound	\$150	\$2,332	\$3,032	30.0%
608	12/1/2017	63	66	3-Year	90-Day	3% Compound	\$200	\$3,683	\$4,787	30.0%
609	12/7/2017	63	66	3-Year	90-Day	3% Compound	\$100	\$2,830	\$3,678	30.0%
610	12/13/2017	60	63	6-Year	90-Day	None	\$300	\$3,413	\$3,413	0.0%
611	12/13/2017	57	60	3-Year	180-Day	3% Compound	\$150	\$1,876	\$2,439	30.0%
612	12/13/2017	62	65	3-Year	180-Day	3% Compound	\$150	\$2,760	\$3,588	30.0%
613	12/15/2017	60	63	4-Year	90-Day	3% Compound	\$110	\$2,098	\$2,728	30.0%
614	12/15/2017	59	62	5-Year	180-Day	3% Compound	\$150	\$1,818	\$2,364	30.0%
615	12/18/2017	55	58	6-Year	180-Day	3% Compound	\$100	\$1,828	\$2,377	30.0%
616	12/20/2017	58	61	6-Year	90-Day	3% Compound	\$300	\$5,912	\$7,686	30.0%
617	1/3/2018	61	63	6-Year	180-Day	3% Compound	\$100	\$1,960	\$2,548	30.0%
618	1/3/2018	56	58	4-Year	90-Day	3% Compound	\$180	\$4,110	\$5,343	30.0%
619	1/10/2018	58	60	5-Year	90-Day	3% Compound	\$150	\$2,848	\$3,703	30.0%
620	1/10/2018	54	56	5-Year	90-Day	3% Compound	\$180	\$2,338	\$3,039	30.0%
621	1/10/2018	53	55	5-Year	90-Day	3% Compound	\$180	\$2,278	\$2,961	30.0%
622	1/16/2018	58	60	3-Year	90-Day	3% Compound	\$50	\$726	\$943	30.0%
623	1/16/2018	58	60	6-Year	90-Day	3% Compound	\$220	\$4,167	\$5,418	30.0%
624	1/20/2018	68	70	5-Year	180-Day	None	\$200	\$3,859	\$3,859	0.0%
625	2/12/2018	55	57	4-Year	90-Day	3% Compound	\$250	\$3,493	\$4,541	30.0%
626	2/16/2018	67	69	3-Year	90-Day	3% Compound	\$200	\$3,547	\$4,611	30.0%
627	2/21/2018	59	61	3-Year	90-Day	3% Compound	\$220	\$4,713	\$6,127	30.0%
628	2/25/2018	52	54	2-Year	90-Day	3% Compound	\$120	\$1,150	\$1,494	30.0%
629	2/25/2018	44	46	2-Year	90-Day	3% Compound	\$120	\$896	\$1,165	30.0%
630	3/6/2018	50	52	6-Year	90-Day	3% Compound	\$200	\$3,101	\$4,032	30.0%
631	3/6/2018	61	63	2-Year	90-Day	3% Compound	\$200	\$3,175	\$4,128	30.0%
632	3/9/2018	62	64	3-Year	90-Day	3% Compound	\$200	\$2,916	\$3,790	30.0%
633	3/20/2018	59	61	3-Year	90-Day	3% Compound	\$80	\$1,294	\$1,682	30.0%
634	3/20/2018	61	63	3-Year	90-Day	3% Compound	\$80	\$1,099	\$1,429	30.0%
635	3/23/2018	58	60	5-Year	90-Day	3% Compound	\$170	\$3,892	\$5,060	30.0%
636	3/24/2018	68	70	5-Year	90-Day	3% Compound	\$180	\$5,134	\$6,674	30.0%
637	4/1/2018	60	62	4-Year	90-Day	3% Compound	\$250	\$5,407	\$7,029	30.0%
638	4/10/2018	62	64	5-Year	90-Day	3% Compound	\$200	\$4,900	\$6,371	30.0%
639	4/11/2018	54	56	5-Year	90-Day	3% Compound	\$150	\$1,680	\$2,184	30.0%
640	4/11/2018	53	55	5-Year	90-Day	3% Compound	\$130	\$1,576	\$2,048	30.0%
641	4/23/2018	57	59	2-Year	90-Day	3% Compound	\$110	\$1,286	\$1,672	30.0%
642	4/23/2018	55	57	2-Year	90-Day	3% Compound	\$110	\$1,236	\$1,607	30.0%
643	4/25/2018	67	69	4-Year	180-Day	3% Compound	\$200	\$4,784	\$6,220	30.0%
644	4/26/2018	64	66	6-Year	90-Day	3% Compound	\$350	\$10,563	\$13,731	30.0%
645	5/1/2018	60	62	4-Year	90-Day	3% Compound	\$150	\$2,437	\$3,169	30.0%
646	5/1/2018	62	64	3-Year	90-Day	3% Compound	\$130	\$2,696	\$3,504	30.0%
647	5/2/2018	63	65	5-Year	90-Day	3% Compound	\$150	\$3,503	\$4,554	30.0%
648	5/2/2018	61	63	5-Year	90-Day	3% Compound	\$150	\$3,169	\$4,119	30.0%
649	5/4/2018	50	52	6-Year	90-Day	3% Compound	\$100	\$1,410	\$1,833	30.0%
650	5/4/2018	50	52	6-Year	90-Day	3% Compound	\$100	\$1,269	\$1,650	30.0%
651	5/10/2018	50	52	4-Year	90-Day	3% Compound	\$200	\$2,416	\$3,141	30.0%
652	5/10/2018	50	52	4-Year	90-Day	3% Compound	\$200	\$2,685	\$3,490	30.0%
653	5/11/2018	59	61	4-Year	90-Day	3% Compound	\$200	\$3,509	\$4,562	30.0%
654	5/22/2018	51	53	3-Year	90-Day	3% Compound	\$170	\$2,521	\$3,277	30.0%
655	5/22/2018	62	64	3-Year	90-Day	3% Compound	\$170	\$3,391	\$4,408	30.0%
656	6/24/2018	64	66	3-Year	90-Day	3% Compound	\$250	\$4,258	\$5,535	30.0%
657	6/24/2018	65	67	3-Year	90-Day	3% Compound	\$250	\$5,645	\$7,339	30.0%
658	6/25/2018	67	69	3-Year	90-Day	None	\$200	\$3,042	\$3,042	0.0%
659	6/26/2018	61	63	3-Year	90-Day	3% Compound	\$100	\$1,511	\$1,964	30.0%
660	6/26/2018	59	61	3-Year	90-Day	3% Compound	\$100	\$1,422	\$1,849	30.0%

Attachment 9
Massachusetts Mutual Life Insurance Company
Seriatim Listing of Pennsylvania Insureds In Force as of December 31, 2020^[1]
513 Series

Pennsylvania Insured Count	Issue Date	Issue Age	Attained Age at 12/31/2020	Benefit Period	Elimination Period	Inflation Protection	Uninflated Daily Benefit	Current Annualized Premium	Proposed Annualized Premium ^[2]	Proposed Increase
661	6/29/2018	59	61	3-Year	90-Day	3% Compound	\$200	\$3,819	\$4,965	30.0%
662	7/1/2018	57	59	3-Year	90-Day	3% Compound	\$200	\$2,907	\$3,779	30.0%
663	7/15/2018	66	68	3-Year	90-Day	3% Compound	\$300	\$4,834	\$6,284	30.0%
664	7/15/2018	64	66	3-Year	90-Day	3% Compound	\$50	\$649	\$843	30.0%
665	7/17/2018	70	72	3-Year	90-Day	3% Compound	\$100	\$3,063	\$3,982	30.0%
666	7/20/2018	60	62	4-Year	90-Day	3% Compound	\$150	\$2,472	\$3,214	30.0%
667	7/31/2018	62	64	5-Year	90-Day	3% Compound	\$100	\$2,024	\$2,632	30.0%
668	7/31/2018	61	63	5-Year	90-Day	3% Compound	\$100	\$1,777	\$2,310	30.0%
669	8/1/2018	56	58	3-Year	90-Day	3% Compound	\$160	\$2,386	\$3,101	30.0%
670	8/1/2018	57	59	3-Year	90-Day	3% Compound	\$200	\$3,578	\$4,652	30.0%
671	8/6/2018	62	64	6-Year	90-Day	3% Compound	\$230	\$6,734	\$8,754	30.0%
672	8/7/2018	62	64	3-Year	90-Day	3% Compound	\$150	\$2,309	\$3,002	30.0%
673	8/23/2018	55	57	6-Year	180-Day	3% Compound	\$150	\$1,784	\$2,319	30.0%
674	8/23/2018	53	55	6-Year	180-Day	3% Compound	\$150	\$1,986	\$2,582	30.0%
675	8/28/2018	64	66	4-Year	90-Day	3% Compound	\$200	\$3,754	\$4,880	30.0%
676	8/30/2018	48	50	3-Year	90-Day	3% Compound	\$150	\$2,124	\$2,761	30.0%
677	8/30/2018	65	67	5-Year	90-Day	3% Compound	\$150	\$3,643	\$4,736	30.0%
678	9/4/2018	65	67	4-Year	90-Day	3% Compound	\$280	\$5,387	\$7,003	30.0%
679	9/4/2018	65	67	4-Year	90-Day	3% Compound	\$280	\$4,848	\$6,302	30.0%
680	9/10/2018	54	56	6-Year	90-Day	3% Compound	\$130	\$1,971	\$2,562	30.0%
681	9/18/2018	64	66	6-Year	90-Day	3% Compound	\$150	\$3,001	\$3,901	30.0%
682	9/23/2018	63	65	2-Year	90-Day	None	\$50	\$1,790	\$1,790	0.0%
683	9/23/2018	63	65	3-Year	90-Day	3% Compound	\$150	\$2,267	\$2,947	30.0%
684	9/25/2018	60	62	5-Year	90-Day	3% Compound	\$150	\$3,651	\$4,747	30.0%
685	9/25/2018	55	57	6-Year	90-Day	3% Compound	\$250	\$4,474	\$5,816	30.0%
686	9/26/2018	53	55	5-Year	90-Day	None	\$200	\$3,261	\$3,261	0.0%
687	9/26/2018	51	53	5-Year	90-Day	3% Compound	\$200	\$3,412	\$4,436	30.0%
688	9/27/2018	58	60	3-Year	90-Day	3% Compound	\$220	\$3,636	\$4,727	30.0%
689	10/13/2018	57	59	5-Year	90-Day	3% Compound	\$200	\$3,900	\$5,070	30.0%
690	10/23/2018	57	59	4-Year	90-Day	3% Compound	\$200	\$3,349	\$4,354	30.0%
691	10/25/2018	55	57	5-Year	90-Day	3% Compound	\$200	\$3,983	\$5,178	30.0%
692	10/25/2018	67	69	5-Year	90-Day	3% Compound	\$290	\$11,105	\$14,436	30.0%
693	10/31/2018	64	66	3-Year	90-Day	None	\$70	\$1,524	\$1,524	0.0%
694	11/5/2018	62	64	5-Year	90-Day	3% Compound	\$170	\$5,262	\$6,840	30.0%
695	11/8/2018	60	62	6-Year	90-Day	3% Compound	\$150	\$3,368	\$4,378	30.0%
696	11/8/2018	64	66	3-Year	90-Day	3% Compound	\$150	\$2,625	\$3,413	30.0%
697	11/9/2018	67	69	3-Year	90-Day	3% Compound	\$150	\$3,123	\$4,060	30.0%
698	11/12/2018	60	62	5-Year	90-Day	3% Compound	\$150	\$2,995	\$3,893	30.0%
699	11/28/2018	61	63	5-Year	90-Day	3% Compound	\$150	\$2,553	\$3,318	30.0%
700	11/28/2018	60	62	5-Year	90-Day	3% Compound	\$150	\$2,352	\$3,057	30.0%
701	12/1/2018	59	61	3-Year	90-Day	3% Compound	\$250	\$3,567	\$4,638	30.0%
702	12/1/2018	59	61	3-Year	90-Day	3% Compound	\$250	\$3,755	\$4,882	30.0%
703	12/1/2018	60	62	3-Year	90-Day	3% Compound	\$250	\$3,469	\$4,509	30.0%
704	12/1/2018	55	57	3-Year	90-Day	3% Compound	\$250	\$2,687	\$3,493	30.0%
705	12/5/2018	67	69	3-Year	90-Day	None	\$200	\$2,865	\$2,865	0.0%
706	12/5/2018	66	68	3-Year	90-Day	None	\$200	\$2,680	\$2,680	0.0%
707	12/11/2018	49	51	3-Year	90-Day	3% Compound	\$200	\$2,428	\$3,156	30.0%
708	1/4/2019	66	67	3-Year	90-Day	3% Compound	\$150	\$3,315	\$4,309	30.0%
709	1/4/2019	67	68	3-Year	90-Day	3% Compound	\$150	\$3,478	\$4,521	30.0%
710	1/7/2019	58	59	5-Year	90-Day	3% Compound	\$200	\$4,153	\$5,399	30.0%
711	1/19/2019	58	59	4-Year	90-Day	3% Compound	\$400	\$6,666	\$8,665	30.0%
712	1/29/2019	65	66	6-Year	90-Day	3% Compound	\$150	\$2,865	\$3,724	30.0%
713	2/2/2019	55	56	6-Year	90-Day	3% Compound	\$200	\$3,165	\$4,115	30.0%
714	2/2/2019	52	53	6-Year	90-Day	3% Compound	\$100	\$1,387	\$1,803	30.0%
715	2/4/2019	63	64	3-Year	90-Day	3% Compound	\$200	\$3,314	\$4,309	30.0%
716	2/4/2019	64	65	3-Year	90-Day	3% Compound	\$190	\$3,967	\$5,157	30.0%
717	2/4/2019	60	61	3-Year	90-Day	3% Compound	\$190	\$3,276	\$4,258	30.0%
718	2/6/2019	64	65	3-Year	90-Day	3% Compound	\$140	\$3,582	\$4,657	30.0%
719	2/6/2019	58	59	6-Year	30-Day	3% Compound	\$200	\$4,989	\$6,486	30.0%
720	2/6/2019	44	45	3-Year	180-Day	3% Compound	\$150	\$1,707	\$2,219	30.0%
721	2/6/2019	52	53	6-Year	90-Day	3% Compound	\$180	\$2,875	\$3,738	30.0%
722	2/13/2019	66	67	3-Year	90-Day	3% Compound	\$120	\$2,247	\$2,921	30.0%
723	2/19/2019	49	50	6-Year	90-Day	5% Compound	\$150	\$5,261	\$6,839	30.0%
724	2/20/2019	59	60	2-Year	90-Day	3% Compound	\$50	\$830	\$1,079	30.0%
725	2/20/2019	64	65	2-Year	90-Day	3% Compound	\$50	\$1,038	\$1,349	30.0%
726	2/26/2019	55	56	6-Year	90-Day	5% Compound	\$200	\$7,625	\$9,913	30.0%
727	2/28/2019	54	55	6-Year	90-Day	3% Compound	\$130	\$2,737	\$3,558	30.0%
728	3/5/2019	62	63	4-Year	90-Day	3% Compound	\$150	\$2,475	\$3,217	30.0%
729	3/5/2019	58	59	4-Year	90-Day	3% Compound	\$150	\$2,542	\$3,305	30.0%
730	3/14/2019	66	67	4-Year	90-Day	3% Compound	\$100	\$2,706	\$3,518	30.0%
731	3/14/2019	66	67	4-Year	90-Day	3% Compound	\$100	\$2,165	\$2,814	30.0%
732	3/17/2019	44	45	6-Year	90-Day	3% Compound	\$150	\$2,456	\$3,193	30.0%
733	3/20/2019	53	54	5-Year	90-Day	3% Compound	\$200	\$2,538	\$3,300	30.0%
734	3/20/2019	51	52	5-Year	90-Day	3% Compound	\$200	\$3,549	\$4,614	30.0%
735	4/12/2019	47	48	3-Year	90-Day	3% Compound	\$300	\$4,124	\$5,361	30.0%
736	4/15/2019	60	61	2-Year	90-Day	None	\$200	\$1,834	\$1,834	0.0%
737	4/18/2019	45	46	3-Year	90-Day	3% Compound	\$200	\$1,801	\$2,342	30.0%
738	4/18/2019	49	50	3-Year	90-Day	3% Compound	\$200	\$2,132	\$2,772	30.0%
739	5/8/2019	62	63	3-Year	90-Day	3% Compound	\$150	\$3,019	\$3,924	30.0%

[1] Reflects changes in benefit coverage through December 31, 2021.

[2] The actual rate increases implemented may vary due to implementation rounding algorithms.

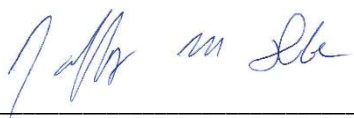
Letter of Authorization

To: Department of Insurance

Massachusetts Mutual Life Insurance Company ("MassMutual") has entered into a service agreement with Milliman, Inc. ("Milliman") effective October 19, 2017 that includes long-term care rate filing services on our behalf. The agreement provides, in part, that Milliman is responsible for preparing and filing for approval with state insurance departments MassMutual's long-term care rate increase filings as directed by MassMutual. Milliman is also authorized to receive, on MassMutual's behalf, written and oral communication from each state department of insurance for the purpose of completing the rate increase filing process.

Please accept this letter of authorization for the purpose stated above. Should you have any questions regarding the above, please forward your comments to:

Massachusetts Mutual Life Insurance Company
1295 State Street
Springfield, MA 01001

A handwritten signature in blue ink, appearing to read "Jeffrey Dube", written over a horizontal line.

Jeffrey Dube
Head of Inforce Management
Massachusetts Mutual Life Insurance Company

September 26, 2022
Date

Please read this letter carefully and in its entirety. It contains important information about your long term care insurance policy. Using the contact information at the end of this letter, you may contact your financial professional or our Long Term Care Administrative Office with any questions regarding this letter or your long term care insurance coverage.

[Date]

[Policyowner Name]
[Joint Policyowner Name]
[Address]
[City], [State] [Zip]

RE: Notice of a Premium Increase to your Long Term Care Insurance Policy #[AA-XXXXXXXX] issued on [MM/DD/CCYY] in your Contract State of [Contract State]

Decision required by the Policy Anniversary Date: [MM/DD/CCYY]

Dear [Policyowner Name],

MassMutual's purpose is to help people secure their future and protect the ones they love. One way in which we do this is by offering long term care insurance and ensuring that long term care insurance benefits will be available when our policyowners need them.

Your long term care insurance policy is an important component of your plans to help you maintain your financial independence and standard of living throughout your lifetime. When you purchased your policy, you made a wise decision to plan ahead so that you have options for your long term care needs if and when you may need them.

After a careful and thorough assessment, we have made the difficult decision to increase premium rates on many of our existing long term care insurance policies.

To help you understand the need for this increase, please be aware that many factors have changed over the years that have impacted the pricing of long term care insurance policies. Based on current information, insurers now expect to pay higher amounts of benefits than had been originally anticipated, resulting in the need for many insurers to request premium rate increases on inforce (existing) policies.

As is common in the long term care insurance industry, MassMutual long term care insurance policies are guaranteed renewable. This means as long as you pay your premium, we cannot cancel or refuse to renew your policy, but we may increase premium rates. This information is provided in the Renewability provision on the front cover of your policy. MassMutual specifically filed its individual standalone long term care policies as

Massachusetts Mutual Life Insurance Company
Long Term Care Administrative Office
[21600 Oxnard Street, Suite 1500 • Mailing Address: Post Office Box 4243
Woodland Hills, CA 91365-4243
(888) 505-0394 • Fax (818) 867-2503]



guaranteed renewable to ensure it had the ability to raise rates in the future if experience were to deteriorate to the point where rate increases were actuarially justified.

It is important to know that no individual or policy can be or has been singled out due to a change in the insured's age, health, claims history, or any other individual characteristic.

The regulatory process to implement a premium rate increase has been completed in your Contract State, and as a result, your policy is among others being impacted.

We understand that a premium increase may be difficult, and we are committed to helping you understand your options so that you can make the best decision for your personal situation.

About this increase

The following grid provides information on your current (as of the Policy Anniversary Date) long term care insurance policy and details regarding the change to your policy's premium:

Benefit Period	[Lifetime]
Daily Benefit Amount	[\$9,999.99]
Elimination Period	[90 days]
Inflation Protection	[None]
Your Old [Mode] Premium	[\$999.99]
Your New [Mode] Premium	[\$999.99]
Percentage Increase in Premium	[999.9%]
Effective Date of New Premium	[MM/DD/CCYY] (Policy Anniversary Date)

[IMPORTANT NOTICE REGARDING WAIVER OF PREMIUM: Your premium will increase on the Policy Anniversary Date of [MM/DD/CCYY] even while your policy's premium is being waived. Your current coverage will continue and your increased premium will continue to be waived.]

[Your state Insurance Department allowed an increase in premium rates to be implemented over a multi-year period. Your new [mode] premium effective [MM/DD/CCYY] is shown above; additional increases will take effect as shown in the table below (all values assume you continue your current coverage):

Effective Date of New Premium	Percentage Increase in Premium	Your New [Mode] Premium
[MM/DD/CCYY]	[999.9%]	[\$999.99]
[MM/DD/CCYY]	[999.9%]	[\$999.99]
[MM/DD/CCYY]	[999.9%]	[\$999.99]

]

Understanding your options

You always have the option to continue your current coverage at the new premium.

However, there may be several options available to you that will reduce your policy's premium, such as:

- **Reduce the Benefit Period (BP).** Reducing the BP will reduce the maximum length of time the policy will pay benefits and the total amount of benefits payable under your policy. Any daily, weekly, monthly or annual benefit limits would continue to apply.
- **Reduce the maximum Daily Benefit Amount (DBA).** Reducing the maximum DBA will reduce the maximum amount the policy will pay for covered expenses per day and the total amount of benefits payable under your policy. This will also reduce any weekly, monthly or annual benefit amount limits available on the policy.
- **Extend the Elimination Period (EP).** Extending the EP increases the length of time you will be responsible for paying for long term care services before we will begin paying benefits.
- **Remove or reduce optional riders.** Removing or reducing an optional rider will mean you will no longer have or be eligible for the features and benefits that the rider provides. The following riders are attached to your policy:
 - [Rider Name 1][none]
 - [[Rider Name 2]
 - [Rider Name 3]]

Each option should be viewed in light of your individual needs and financial situation. By reducing the policy's benefits, you reduce the coverage available to pay for future care. You may not be able to increase your benefits at a later time, even if you offer to pay the increased premium amount.

A Personalized Options Election Form and Instructions are being provided to you in this package, which outline the above options for reducing your coverage and the impact on your premium. We recommend you review all options available to you, including paying the increased premium, with trusted family members, your financial professional and/or a member of our Long Term Care Administrative Office to help you determine the approach that is most appropriate for your needs.

You may also wish to contact your State Department/Bureau of Insurance if you need additional counseling to help determine how to proceed. Please go to http://naic.org/state_web_map.htm for information on how to contact your State Department/Bureau of Insurance.

Possible future changes

It is possible that rates could increase again in the future. If they do, we will plan to follow a similar notification process.

What you need to do

- 1. If you want to keep your current coverage, simply pay your policy's new [mode] premium by the Policy Anniversary Date of [MM/DD/CCYY]. We do not need to hear from you, and you do not need to return the Personalized Options Election Form.**
- 2. If you want to change your current coverage, complete and return the enclosed Personalized Options Election Form or otherwise submit your change request in writing by the Policy Anniversary Date of [MM/DD/CCYY].**
- 3. If you decide not to continue coverage, complete and return the Personalized Options Election Form to choose the [Contingent Benefit Upon Lapse] [Nonforfeiture Rider] option.**

[Note: If we do not hear from you and you do not pay the new premium, your coverage will continue under the terms of your Nonforfeiture Rider for lapse due to non-payment of premium.]

[Note: If we do not hear from you and you do not pay the new premium, your policy will lapse due to non-payment of premium. If applicable, the Contingent Benefit Upon Lapse option outlined later in this packet will automatically be provided to you.]

[IMPORTANT NOTE ABOUT BILLING: If we do not hear from you at least 50 days prior to the Policy Anniversary Date of [MM/DD/CCYY], your next bill will reflect the new premium based on your current coverage. However, as long as we receive your request to change coverage by the Policy Anniversary Date of [MM/DD/CCYY], we will process your request effective as of that date, notify you of the new premium due, and refund excess premium paid, if any.]

If your payment is made via a third-party account or online banking, please make appropriate arrangements to revise the payment amount.]

[IMPORTANT NOTE ABOUT PRE-AUTHORIZED CHECKING (PAC) WITHDRAWALS: As long as we receive your request to change coverage by your Policy Anniversary Date of [MM/DD/CCYY], we will process your request effective as of that date, notify you of the premium amount for your next monthly PAC withdrawal and refund excess premium paid, if any.]

The need for care can be one of the most significant challenges a person can face, both personally and financially. We have seen the difference that long term care insurance coverage has made in the lives of our customers and their family members. Although the



cost for this insurance is increasing, it provides valuable coverage that may not be available from health insurance or government programs.

We recommend that you carefully review all the options available to you (including paying the rate increase and considering any available benefit reduction options) with trusted family members, a financial professional and/or a member of our Long Term Care Administrative Office to help you determine which option may be most appropriate.

We value your business and trust, and remain committed to helping you with your long term care needs. And we are here to help you.

Sincerely,

[Executive]
[Title]

PS: Please retain a copy of this letter with your policy for future reference.

Enclosures: Instructions, Personalized Options Election Form

cc: [Agent Name][&][Insured Name]

Financial Professional	Massachusetts Mutual Life Insurance Co. Long Term Care Administrative Office
[Agent Name] [Agency Name] [Agent Phone]	MassMutual Long Term Care Administrative Office [21600 Oxnard Street, Suite 1500 PO Box 4243 Woodland Hills, CA 91365 T: (888) 505-0394 Mon. - Fri., 10 AM to 8 PM ET]

[Important Information about the Contingent Benefit Upon Lapse Option]

If you decide not to pay the increased premiums associated with your long term care insurance policy, and your policy lapses within the 120 days following the Policy Anniversary Date of [MM/DD/CCYY], you may convert your policy to a paid-up status with reduced benefits and no future premiums will be due. Your policy must be paid to the Policy Anniversary Date in order for this benefit to be available.

Continuing your coverage beyond 120 days after the Policy Anniversary Date of [MM/DD/CCYY] voids the Contingent Benefit Upon Lapse option.

The following terms apply to this option:

- Electing this option will not increase your coverage, which means the total benefits paid under the policy will never exceed the maximum benefits that would be payable had the policy remained in premium paying status.
- Subject to the above, your [Total] Benefit Amount will be reduced to the greater of the total of premiums paid for the policy and riders or 30 times the Daily Benefit Amount on the date of policy lapse.
- Benefits will be paid subject to the daily/weekly/monthly/annual benefit limits in effect on the date of policy lapse.
- No further benefit increases will occur under an inflation protection rider, if attached to the policy.
- [Any Covered Partner riders attached to your policy and your Covered Partner's policy will terminate.]
- Other than as described above, your coverage is subject to the same policy benefit provisions, Elimination Period, limitations and exclusions, and all other provisions of the policy and riders that were in effect on the date of policy lapse.

[Your limited pay policy also offers an additional Contingent Benefit Upon Lapse option where both the [Total] Benefit Amount and Daily Benefit Amount are modified as shown in the Personalized Options Election Form.]

By exercising a Contingent Benefit Upon Lapse option, you may be significantly reducing your policy benefits. Therefore, careful consideration is strongly recommended.]

[This page intentionally left blank.]

Instructions to complete the Personalized Options Election Form

The Personalized Options Election Form in this package outlines options available to you if you would like to explore adjusting your long term care insurance policy's new premium amount by reducing or removing benefits.

- This form may not include all options available to you. To understand other options available to you not specified on the form and to obtain premium quotes, please contact our Long Term Care Administrative Office or your financial professional. Contact information is provided at the end of the form.
- Options may not be of equal value and some options can reduce the new premium by more than others.
- Please review this form carefully on your own, with trusted family members, your financial professional and/or a member of our Long Term Care Administrative Office to help you determine which option may be most appropriate.
- To make changes to your policy, this form must be received in our long term care administrative office no later than the Policy Anniversary Date of [MM/DD/CCYY].
- Once we've processed the change you elected, we will send you a confirmation letter along with new policy specification pages to keep with your policy.
- **All policy change requests must be received in writing.**

Personalized Options Election Form

Please return no later than the Policy Anniversary Date: [MM/DD/CCYY]

Prepared for: [Policyowner Name] & Joint Policyowner Name]
MassMutual Long Term Care Insurance Policy #: [AA-XXXXXXX]

Below are some options to reduce benefits and mitigate the impact of the premium rate increase on your current premium. The new premium amounts shown reflect the change taking effect on the Policy Anniversary Date of [MM/DD/CCYY].

IMPORTANT: You can only make one election using this form. Other options may be available to you. If you wish to request a change to your policy not listed on this form, or a combination of changes, please call your financial professional or our Long Term Care Administrative Office to discuss options and obtain additional premium quotes. Contact information is provided below.

Reduce the Benefit Period

- [
- ☐ **Change my [Lifetime] benefit period to [10 years].** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][; [\$9,999.99] on [MM/DD/CCYY+1]][; [\$9,999.99] on [MM/DD/CCYY+2]][; [\$9,999.99] on [MM/DD/CCYY+3]]].

[Other Benefit Period options available to you are: [6 years, 5 years, 4 years, 3 years, 2 years]. A shorter Benefit Period generally results in a lower premium.]]

[Your policy is already at the minimum allowed in your state, therefore this option is not available to you.]

Reduce the Daily Benefit Amount (DBA)

- [
- ☐ **Change my current DBA as of [MM/DD/CCYY] from [\$9,999.99] to [\$9,999.99].** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][; [\$9,999.99] on [MM/DD/CCYY+1]][; [\$9,999.99] on [MM/DD/CCYY+2]][; [\$9,999.99] on [MM/DD/CCYY+3]]].
- ☐ **Change my current DBA as of [MM/DD/CCYY] from [\$9,999.99] to [\$9,999.99].** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][; [\$9,999.99] on [MM/DD/CCYY+1]][; [\$9,999.99] on [MM/DD/CCYY+2]][; [\$9,999.99] on [MM/DD/CCYY+3]]].

[You have additional DBA reduction options available to you, but your DBA can be no less than [\$9,999.99].]

Massachusetts Mutual Life Insurance Company
Long Term Care Administrative Office
[21600 Oxnard Street, Suite 1500 • Mailing Address: Post Office Box 4243
Woodland Hills, CA 91365-4243
(888) 505-0394 • Fax (818) 867-2503]

[Your policy is already at the minimum allowed in your state, therefore this option is not available to you.]

Extend the Elimination Period

- [
- ☐ **Change my [0-day] Elimination Period to [30-day].** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][[: [\$9,999.99] on [MM/DD/CCYY+1]][: [\$9,999.99] on [MM/DD/CCYY+2]][: [\$9,999.99] on [MM/DD/CCYY+3]]].

[Other Elimination Period options available to you are: [60-day, 90-day, 180-day]. A longer Elimination Period generally results in a lower premium.]]

[Your policy is already at the maximum allowed in your state, therefore this option is not available to you.]

Reduce or Remove Inflation Protection Rider

- [
- ☐ **Change my [5% compound] Inflation Protection to [5% simple].** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][[: [\$9,999.99] on [MM/DD/CCYY+1]][: [\$9,999.99] on [MM/DD/CCYY+2]][: [\$9,999.99] on [MM/DD/CCYY+3]]]. By choosing this option, you will not lose any previously inflated benefits as of your most recent policy anniversary.]
- [
- ☐ **Remove my [5% compound] Inflation Protection Rider.** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][[: [\$9,999.99] on [MM/DD/CCYY+1]][: [\$9,999.99] on [MM/DD/CCYY+2]][: [\$9,999.99] on [MM/DD/CCYY+3]]]. By choosing this option, you will not lose any previously inflated benefits as of your most recent policy anniversary.]

[IMPORTANT: Because your policy includes the Home Care Monthly Benefit Rider, the Inflation Protection Rider is also required. If you elect to remove the Inflation Protection Rider, the Home Care Monthly Benefit Rider will also be automatically removed. The premium shown above for removing the Inflation Protection Rider reflects the removal of both riders.]]

[Your policy does not have an inflation protection rider, so this option is not available to you.]

[Remove Indemnity Benefit Rider

- ☐ **Remove my [Indemnity Benefit Rider][Caregiver Indemnity Benefit Rider].** The new [mode] premium will change to [\$9,999.99] on [MM/DD/CCYY][[: [\$9,999.99] on [MM/DD/CCYY+1]][: [\$9,999.99] on [MM/DD/CCYY+2]][: [\$9,999.99] on [MM/DD/CCYY+3]]].

]

[Nonforfeiture Rider] [Contingent Benefit Upon Lapse] option

I want to discontinue paying premiums and convert my policy to paid-up status with reduced benefits. The [Total] Benefit Amount below is calculated based on premium and benefits paid as of [file extract date]. The Daily Benefit Amount below is as of [MM/DD/CCYY]. The actual values will be calculated based on the date of policy lapse.

- ☐ [Option 1:] The new [Total] Benefit Amount is [\$99,999.99] and the new Daily Benefit Amount is [\$9,999.99].
- ☐ [Option 2:] The new [Total] Benefit Amount is [\$99,999.99] and the new Daily Benefit Amount is [\$9,999.99].

[SOME IMPORTANT CONSIDERATIONS WHEN MAKING YOUR DECISION:]

[You may also choose to remove or reduce any optional riders that are currently on your policy. A list of all your riders can be found in the "Understanding your options" section of this letter. You should consider how removing or reducing a rider may impact other riders on your policy.]

[Removing or reducing an Inflation Protection Rider may impact future eligibility under your Contract State's partnership program.]

[Removing or reducing rider(s) or policy benefits may impact future eligibility for MassHealth (Medicaid) exemptions.]

[Reducing benefits or removing riders on your policy may impact the benefits and riders on your Covered Partner's policy. Additionally, if you terminate your policy or elect the [Nonforfeiture Rider][Contingent Benefit Upon Lapse] option, any Covered Partner riders will terminate on your policy and your Covered Partner's policy.]

[You should consider the number of remaining premium payments on your policy before reducing your benefits. It may not be advisable to remove or reduce benefits and/or riders if few premium payments remain. If you pay your premium as scheduled, your policy will become paid-up on [MM/DD/CCYY].]

]

You have up until the Policy Anniversary Date of [MM/DD/CCYY] to make or modify any changes you elect on this form. [In order to elect the Contingent Benefit Upon Lapse option, your policy must be paid to the Policy Anniversary Date.]

By signing below, you acknowledge and agree that any change(s) will be effective on the Policy Anniversary Date of [MM/DD/CCYY] provided this form is received at our Long Term Care Administrative Office by that date.

Name of Policyowner: [Policyowner Name]
[Name of Joint Policyowner: [Joint Policyowner Name]]
Name of Insured: [Insured Name]
[Name of Joint Insured: [Joint Insured Name]]
Policy #: [Policy AA-XXXXXXXX]

Signature of Policyowner: _____

Signature of Joint Policyowner: _____
(if applicable)

Date: _____

Please return this form using the enclosed postage-paid envelope.

Financial Professional	Massachusetts Mutual Life Insurance Co. Long Term Care Administrative Office
[Agent Name] [Agency Name] [Agent Phone]	MassMutual Long Term Care Administrative Office [21600 Oxnard Street, Suite 1500 PO Box 4243 Woodland Hills, CA 91365 T: (888) 505-0394 Mon. - Fri., 10 AM to 8 PM ET]



8500 Normandale Lake Blvd.
Suite 1850
Minneapolis, MN 55437-3830
USA

Tel +1 952 897 5300

milliman.com

December 6, 2022

Michael Hibbert
Pennsylvania Insurance Department (Department)

Via SERFF

Re: Massachusetts Mutual Life Insurance Company (MassMutual)
Company NAIC # 65935
SERFF Tracking # MILL-133345234
513 Series
Tax-Qualified Comprehensive Long-Term Care Policy Form MM500-P-2-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form MM502-P-2-PA et al.

Dear Michael,

Thank you for reviewing this filing. This letter is in response to your letter dated October 26, 2022 regarding the above-referenced filing. The remainder of this letter provides the additional information requested in your October 26 letter. Each request is restated in *italics* for reference.

1. *Section 18 of the actuarial memorandum states that “The adverse experience is driven by higher-than-expected persistency and morbidity”. Please discuss further the adverse morbidity and persistency experience that resulted in the need for the current rate increase. In particular, discuss re-pricing assumptions that have changed from the last increase approved nationwide, discuss any changes due to internal experience studies, and discuss any changes due to updated consultant data.*

Summaries of the current and original pricing assumptions are provided in Section 6 and Exhibit III of the October 4 actuarial memorandum, respectively. As can be seen in Section 6 and Exhibit III, lapse, mortality, and morbidity assumptions have all been changed from those used in original pricing. These assumption changes are a result of deterioration of experience since the time of original pricing.

The actuarial assumptions for morbidity and persistency in this rate increase filing were based on an experience study performed in 2021 as described in Appendix A of the October 4 actuarial memorandum. The assumptions in this filing were developed using pooled experience of the company's stand-alone long-term care business. Where actual experience had low credibility or did not exist, industry experience and actuarial judgment was also used. Additional detail regarding the analysis to develop the assumptions used in this filing is provided in Appendix A.

Attachment 1 provides the projected impact of the changes from original pricing to current assumptions. The impact of assumptions shows the drivers of moving from original pricing to current assumptions. Included is a comparison of actual and projected nationwide experience to that expected in pricing with respect to morbidity, mortality, lapse, and interest. As seen in Attachment 1, higher-than-expected persistency and morbidity assumptions are driving the need for the current rate increase request.

Offices in Principal Cities Worldwide

This work product was prepared solely to provide assistance to MassMutual. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends recipient be aided by its own actuary or other qualified professional when reviewing the Milliman work product.

2. *Has Covid 19 been factored into your projections.*

As described in Appendix A to the October 4 actuarial memorandum, the COVID-19 pandemic has created uncertainty regarding future LTC experience. However, due to the long duration nature of LTC insurance, minor deviations in experience over a relatively small number of calendar years are not expected to have a significant impact on lifetime projections. Therefore, no adjustments were made to these assumptions to capture anticipated impacts of the pandemic. However, emerging experience and trends will continue to be monitored so that adjustments can be included in the future if believed to be representative of long-term trends.

3. *Please provide the letter that will be used to notify policy holders of the pending rate increase.*

A sample policyowner notification letter has been submitted on the Supporting Documentation tab of SERFF. Please note that slight variations in letter language may occur that do not materially change the information being provided to the policyowner. As these documents do not require department approval, we understand that it was not and will not be necessary to file each of these minor variations with the department.

4. *Please provide your best estimate of the date when the first letter will be mailed informing policyholders of this premium increase.*

Rate increase notification letters will first be sent to policyowners approximately three months after the approval of the requested rate increase—depending upon the capacity of the third-party administrator at that time—and at least 60 days prior to any policyowners' policy anniversary date when the rate increase would take effect.

5. *Please confirm that no increase on this block has been implemented in any jurisdiction; otherwise, provide the rate increase history by state on this series (include a column that shows the cumulative increase by state) in an Excel spreadsheet.*

No increases have been implemented on this block in any jurisdiction. Attachment 2 provides a status listing, which provides the jurisdictions where an increase has been or will be requested, the average percentage rate increase requested, and the number of insureds that will be affected by the rate increase. For jurisdictions where a rate increase filing has not yet been submitted, while the average percentage rate increase requested column is not yet populated, the same rate increase will be requested as that nationwide, except where required due to regulation and jurisdiction-specific requirements.

6. *Have you included a margin for adverse experience in your projected claims? Is the margin uniform or does it vary in some way? Please explain.*

The experience and projections provided in this filing are considered best-estimate with no provision for adverse deviation. The only exception is in Exhibit II where the incurred claims contain margin to reflect moderately adverse deviations per 31 Pa. Code 89a.118. As described in the October 4 actuarial memorandum, the projected incurred claims in Exhibit II were increased uniformly by 14% (equivalent to a 12.5% reduction to premiums) from the assumptions described in Section 6 of the actuarial memorandum to reflect assumptions that include moderately adverse conditions.

7. *The requested increase on this block is 27.3%. Yet, when we calculate the annual ratio of the premium generated from the current requested increase (calculated via subtraction of the earned premium column vectors) divided by the current annual original premium taken from Exhibit 1, the ratio does not converge to the requested increase. Why does the ratio eventually converge to roughly 22.7%, rather than 27.3%?*

The projected experience provided in Exhibit I-b reflects the insured behavior assumptions (i.e., CBUL and RBO election rates) described in Section 6.d of the actuarial memorandum which results in the ratio of Exhibit I-a and Exhibit I-b premiums being less than the average rate increase when comparing the two exhibits.

In Pennsylvania, the average requested rate increase is 27.3%. Exhibit I reflects nationwide experience, which on average has a requested rate increase of 25.2%. In the year of rate increase implementation, 1.0% of in-force insureds are assumed to elect a CBUL benefit. An additional 6.1% of in-force insureds are assumed to reduce

benefits to offset the requested rate increase, resulting in a 1.2% reduction in premium and claims. Note that these assumed CBUL and RBO elections differ from those provided in Section 6.d of the actuarial memorandum as they reflect the aggregate impact to insured with and without inflation protection.

The result of this average 25.2% rate increase and anticipated CBUL and RBO elections is a 22.5% increase to premiums $(22.5\% = (1 + 25.2\%) \times (1 - 1.0\%) \times (1 - 1.2\%) - 1)$. However, since Exhibit I includes experience of insureds both with and without inflation protection, the impact of the rate increase changes over time due to the mix of business relative to policies with and without inflation protection, which converges to roughly 22.7%.

Projected insured counts and incurred claims in Exhibit I-b are also impacted by the insured behavior assumptions described in Section 6.d of the actuarial memorandum.

8. *Please describe the downgrade options available to policyholders which would mitigate the premium increase.*

As discussed in Section 2 of the October 4 actuarial memorandum, insureds affected by the premium increase are offered the option of reducing their policy benefits to maintain a premium level reasonably close to what they were paying prior to the rate increase. More detail regarding the company's consumer-friendly treatment of reductions to inflation protection is provided in the actuarial memorandum. The enclosed policyowner notification letter outlines several available reduced benefit options. A policyowner can offset some, or all, of the requested rate increase by electing one or more of the reduced benefit options.

Additionally, the company will voluntarily offer a contingent benefit upon lapse to insureds affected by the rate increase, even if the increase is not considered substantial.

Limitations and Qualifications

Milliman's work has been prepared for the use and benefit of MassMutual. Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit any third party recipient of its work product, even if Milliman consents to the release of its work product to such third party.

Milliman's work is being delivered to the Department, in accordance with its statutory and regulatory requirements. Milliman recognizes that materials it delivers to the Department may be public records subject to disclosure to third parties, however, Milliman does not intend to benefit and assumes no duty or liability to any third parties, including the Department, who receive Milliman's work and may include disclaimer language on its work product so stating. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, the Department agrees that it shall not disclose Milliman's work product to third parties without Milliman's prior written consent; provided, however, that the Department may distribute Milliman's work to (i) its professional service providers who are subject to a duty of confidentiality and who agree to not use Milliman's work product for any purpose other than to provide services to the Department, or (ii) any applicable regulatory or governmental agency, as required.

In performing this analysis, we relied on data and other information provided by MassMutual. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. In that event, the results of our analysis may not be suitable for the intended purpose. We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

We have developed certain models to estimate the values included in this analysis. The intent of the models was to estimate future experience. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice.

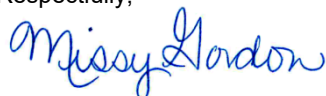
Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

I, Missy Gordon, am a Principal and Consulting Actuary for Milliman, Inc. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render an actuarial opinion as described herein.

◆◆◆

Michael, thank you for working with us to complete this filing in Pennsylvania. Please let me know if you have any additional questions. You can reach me directly at (952) 820-2478 or by e-mail at missy.gordon@milliman.com. Alternatively, you may contact John Hebig, the contact of record for this filing, at (952) 820-2488 or by e-mail at john.hebig@milliman.com.

Respectfully,



Missy Gordon, FSA, MAAA
Principal and Consulting Actuary

MAG/aim

Attachment 1: Impact of Changing from Pricing to Current Assumptions
Attachment 2: State Status Listing

Enclosure: Sample Policyowner Notification Letter

Attachment 1
Massachusetts Mutual Life Insurance Company
Nationwide Historical Experience
Impact of Changing from Pricing to Current Assumptions
513 Series

Scenario	Lifetime Loss Ratio	Incremental Impact on the Lifetime Loss Ratio ^[1]	Increase Needed ^[2]
Original Pricing Assumptions ^[3]	65%	N/A	N/A
Historical Experience through 2020 & Projections with Pricing Assumptions ^[4]	55%	-15%	-26%
Historical Experience through 2020 & Projections with Pricing Assumptions except for Current:			
Interest	55%	0%	0%
Interest & Lapse	56%	2%	4%
Interest & Lapse & Mortality	59%	5%	8%
Interest & Lapse & Mortality & Morbidity	75%	27%	46%
Historical Experience through 2020 & Projections with All Current Most-Likely Assumptions ^[5]	75%	16%	27%

[1] Calculated as the ratio of the lifetime loss ratio in a given row to that in the row immediately above it less one.

[2] These rows show the rate increase needed to reproduce the lifetime loss ratio in the row immediately above it. Calculated without regard to CBUL, RBO, and adverse selection due to the needed rate increase.

[3] Expected experience uses the actual policies sold and projects from issue on a seriatim basis using the original pricing assumptions. The expected loss ratio at the time of original pricing based on assumed sales mix and moderately adverse conditions was 60%.

[4] This row reflects actual historical experience and pricing assumptions projected from the valuation date. The explicit dividend margin assumed in pricing was removed (reduces the lifetime loss ratio) as no dividends have been or are expected to be paid on these policy forms.

[5] This row is calculated in regards to the pricing lifetime loss ratio of 65%.

Attachment 2
Massachusetts Mutual Life Insurance Company
Status of Filings as of December 6, 2022
All Jurisdictions in Which These Forms Are in Force
513 Series

Jurisdiction	12/31/2020 Insureds In Force	12/31/2020 Annualized Premium	Percent of Total Premium	Nationwide Request				
				Average Requested Increase ^[1]	Status	Date Submitted	Disposition Date	Average Increase to be Implemented ^[1]
Alaska	11	\$25,775	0.0%	30%	Not Applicable ^[2]	Not Applicable ^[2]	Not Applicable ^[2]	30%
Alabama	150	\$416,960	0.8%	14%	Pending	10/19/2022		
Arkansas	37	\$93,583	0.2%		Not Yet Filed			
Arizona	284	\$752,611	1.4%	26%	Pending	10/24/2022		
California	2,472	\$7,947,817	14.8%		Not Yet Filed			
Connecticut	387	\$1,429,408	2.7%	25%	Pending	10/3/2022		
District of Columbia	54	\$214,055	0.4%	8%	Approved	10/3/2022	10/27/2022	8%
Delaware	26	\$75,244	0.1%	23%	Pending	11/17/2022		
Florida	1,043	\$3,080,079	5.7%		Not Yet Filed			
Georgia	617	\$1,557,951	2.9%	26%	Pending	10/26/2022		
Hawaii	144	\$348,441	0.6%	28%	Pending	10/4/2022		
Iowa	118	\$302,367	0.6%	27%	Pending	10/10/2022		
Idaho	29	\$68,110	0.1%	25%	Pending	10/5/2022		
Illinois	552	\$1,648,127	3.1%	26%	Pending	10/24/2022		
Indiana	159	\$503,228	0.9%	21%	Pending	12/2/2022		
Kansas	156	\$393,773	0.7%	29%	Pending	11/17/2022		
Kentucky	133	\$318,862	0.6%	23%	Approved	10/6/2022	10/12/2022	23%
Louisiana	130	\$344,449	0.6%	23%	Pending	11/28/2022		
Massachusetts	808	\$2,864,366	5.3%	26%	Pending	9/26/2022		
Maryland	533	\$1,717,511	3.2%	28%	Pending	10/12/2022		
Maine	81	\$265,648	0.5%		Not Yet Filed			
Michigan	343	\$878,047	1.6%	23%	Approved	10/19/2022	11/22/2022	23%
Minnesota	271	\$658,026	1.2%	29%	Pending	11/15/2022		
Mississippi	121	\$311,677	0.6%	19%	Pending	9/27/2022		
Montana	22	\$88,809	0.2%		Not Yet Filed			
North Carolina	647	\$1,815,978	3.4%	27%	Pending	10/6/2022		
North Dakota	57	\$139,109	0.3%		Not Yet Filed			
Nebraska	158	\$389,233	0.7%	28%	Pending	11/11/2022		
New Hampshire	131	\$432,300	0.8%	28%	Pending	11/21/2022		
New Jersey	925	\$3,173,672	5.9%	25%	Pending	10/11/2022		
New Mexico	79	\$223,249	0.4%	23%	Pending	11/16/2022		
Nevada	57	\$147,772	0.3%		Not Yet Filed			
New York	2,069	\$8,272,983	15.4%	21%	Pending	11/14/2022		
Ohio	379	\$1,047,226	1.9%	26%	Pending	10/20/2022		
Oklahoma	180	\$418,111	0.8%	29%	Approved	11/15/2022	12/5/2022	29%
Oregon	79	\$239,998	0.4%	28%	Pending	12/2/2022		
Pennsylvania	739	\$2,212,212	4.1%	27%	Pending	10/4/2022		
Puerto Rico	158	\$292,317	0.5%	10%	Pending	10/17/2022		
Rhode Island	61	\$211,558	0.4%	26%	Pending	10/14/2022		
South Carolina	339	\$878,353	1.6%	24%	Pending	11/30/2022		
South Dakota	40	\$94,565	0.2%	27%	Pending	11/22/2022		
Tennessee	366	\$982,647	1.8%	27%	Pending	10/3/2022		
Texas	1,016	\$2,714,643	5.0%		Not Yet Filed			
Utah	109	\$233,231	0.4%	25%	Pending	11/14/2022		
Virginia	658	\$1,898,763	3.5%	27%	Pending	10/14/2022		
Vermont	56	\$186,018	0.3%	24%	Pending	10/31/2022		
Washington	317	\$842,147	1.6%		Not Yet Filed			
Wisconsin	204	\$581,936	1.1%	29%	Pending	10/24/2022		
West Virginia	38	\$88,159	0.2%	24%	Pending	11/21/2022		
Wyoming	27	\$61,212	0.1%	25%	Pending	11/22/2022		
Total	17,570	\$53,882,317	100%	18%				1%

[1] Average rate increase percentages are based on the distribution of business in force as of December 31, 2020.

[2] Alaska does not require Long-Term Care rates to be filed before use.